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The 1922 meetings of the American Conference of Pharmaceutical Faculties and the National Association of Boards of Pharmacy will also be held in Cleveland during Convention Week

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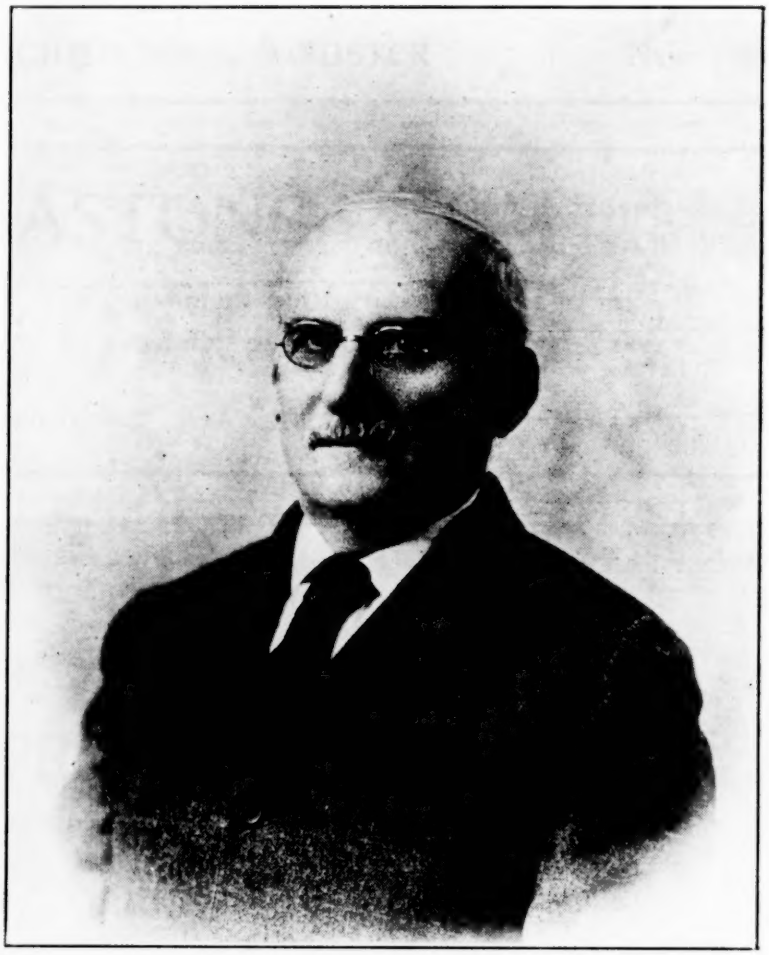

SOLOMON BOEHM

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XI FEBRUARY, 1922 No. 2

SOLOMON BOEHM.*

More than fifty years of membership in the American Pharmaceutical Association, and a somewhat longer period of service as retail pharmacist, are records in the life of our venerable fellow-member, Solomon Boehm. In 1867 the subject of this sketch opened the drug store at the southwest corner of 8th & Morgan Sts., St. Louis; the business developed, and the proprietor gained the esteem of those with whom he came into social and business contact by his fine traits of character, his ability and perseverance; the store is favorably known, and largely through "the man within." The daily press of a metropolis seldom fails to give recognition to citizens who have participated in the city's development, but the notice relative to Mr. Boehm when he celebrated his 81st birthday spoke of more than an octogenarian, successful business man and useful citizen; there was embodied a well-deserved expression of respect for one whose service meant more to him and those with whom he came into business contact than fair dealing alone. He is the oldest retail pharmacist of St. Louis in point of years, continuance in business, and at the same location.

Solomon Boehm was born in Bohemia, April 6, 1840, and came to this country with his parents in 1854. They resided in Iowa when the war between the States broke out; the son gave active service throughout the war, and at its close was commissioned a captain. Soon afterward he came to St. Louis and, in 1867, opened the store which still bears his name.

His interest in pharmacy is shown by his affiliation with local, State and national pharmaceutical bodies, and further by his connection with the St. Louis College of Pharmacy, which institution he served faithfully as treasurer for thirty years. Pharmaceutical training and education were probably recognized by three of Mr. Boehm's sons who are physicians as of great value in a medical education for they are also graduates in pharmacy, but it may be assumed that their father's influence had a part, and to the writer it is somewhat surprising that the other son did not precede his study of law by a course in pharmacy.

Mr. and Mrs. Boehm (nee Miss Jennie Gross Levy) were married January 27, 1874; they have five children—Joseph L., Emil and Julius B., physicians, and Edward M., a lawyer; the daughters, Mrs. David J. Maibrunn and Mrs. Emmett M. Baum, reside in New York City.

* We are indebted to Prof. Francis Hemm for the data for this brief sketch.

EDITORIAL

E. G. EBERLE, EDITOR 253 Bourse Bldg., PHILADELPHIA

REVISIONS OF THE STANDARDS.

BOTH the Revision Committee of the United States Pharmacopoeia and that of the National Formulary are making real progress and along rational lines; a purpose to conclude the revisions in the shortest possible time and to have the standards conform to the needs of those who must use them in the practice of medicine and pharmacy characterizes the work of revision. The other purpose, providing standards and descriptions whereby the pharmacist and others may determine the identity and quality of the officials, is receiving careful investigation and consideration. All of this bespeaks new standards which will be practicable and conform to the needs of those who must use them as guides.

The Pharmacopoeia and National Formulary differ in many respects, but in the editions now being prepared there is a much closer relation than in previous ones. The National Formulary Committee has deleted many items which have a place in a book of formulas, and added at least two important classes—preparations used in veterinary practice and dental preparations, and have secured the co-operation in this work of men well qualified by experience. It is not the intention to enter into a discussion of what has been done along these lines, for this has been presented in papers by those who are qualified to speak, and in reports of officers and members of the Committees.

A large number of workers, not members of the Committees, have coöperated in the revision, and their efforts deserve commendation; unfortunately, perhaps, a larger number among those who must make use of the Standards have had nothing to say; a greater interest on their part might be helpful; pharmacists have exceptional opportunities of learning much about the frequency with which certain drugs and preparations are prescribed and also to make observations in compounding that would contribute valuable information to the revisers. Among this silent number there are many who are afterwards dissatisfied with results. The time to speak is now.

The Pharmacopoeia will always, to some extent, be the result of a compromise, and the National Formulary even more so. Among medical men there are some who would restrict the Pharmacopoeial armamentarium, and a few who would greatly enlarge it, but there is much difference in viewpoint relative to what should be the deletions and inclusions; there is a desire for consensus of opinions—provided these can be brought about by adopting the suggestions of the individuals. This attitude is not so different from other efforts to bring about uniformity; elsewhere even among sectarians there is the hope that the views of one sect will be accepted by the others and all will be of the faith represented by that one, and so far that has been impossible because each holds out for such recognition. In the preparation of these standards the golden mean is therefore desirable, because it will serve best, and a greater number. Our conclusions may be wrong, but there

seems to be a return to drugs among those who formerly employed only a restricted few; they have realized that advancement has been made in drug knowledge. There are others who have held out for an extensive materia medica who now agree that it should be more restricted. In an editorial of the *Pharmaceutical Journal and Pharmacist* of January 7, 1922, on "Pruning the Pharmacopoeia" (British), the Editor states:

"Theoretically it might be a great gain all around if the Pharmacopoeial armamentarium could be restricted to pure active principles, physiologically standardized extracts, and some chemical elements and compounds. Of the many medical systems that have had their day and are forgotten except by the medical historian and the curiosity-monger, there are two of modern origin which had the supreme merit of simplicity *in excelsis*. One of these, the Brunonian system, was the invention of an Edinburgh professor,* to whom it owes its name. This neglected genius held that as all diseases are due either to over-stimulation or depression, two remedies only are necessary; opium for diseases in the first category, and brandy for those in the second. Needless to say, while it lasted this was a very popular system, but as it killed more than it cured it speedily fell into disrepute. The other system, which had more pretensions to scientific sanction, was devised by a Belgian doctor, whose treatise on "Dosimetric Medicine" had a considerable vogue for some years on the Continent, and in this country. Its thesis was quite plausible, namely, that the time has arrived for the substitution, in drug therapeutics, of definite substances with a selective or specific action, for the mixtures of raw material on comparatively unknown composition and obscure action hitherto in use. Thus, morphine or some other appropriate alkaloid of opium should replace the crude drug; quinine should supersede cinchona and its galenical preparations *et id genus omne*. Accordingly, as the title of the system denotes, drug therapeutics will attain scientific precision and uniformity. The system had a fair trial, but somehow failed to fulfil the great expectations entertained by believers in it, and as a system it has now little more than a historic interest, although the nucleus of truth in it may survive to aid in vitalizing some more rational system."

But our purpose is not to comment at length along these lines, but to express satisfaction relative to the substantial progress made in the revisions and the methods followed in the preparation of the Standards; and to encourage a greater interest on the part of those who must use them when they become official. Changes, additions and deletions can be made now, but not after the work of the Committees has been completed. E. G. E.

COMMON SALT IN RELATION TO HEALTH.

DIFFERENCE in the action of alkaloids and alkaloidal drugs and their galenical preparations is attributed to other constituents in these drugs, their combined or modified action, etc. Along related lines the advisability of removing certain substances from foods for producing a better appearing or more palatable article has received considerable attention In concluding an article, "The Present-Day Sources of Common Salt in Relation to Health—and Especially to Iodine Scarcity and Goiter," contributed to the *American Medical Journal*, January 7, 1922, Dr. Emery R. Hayhurst, Professor of Hygiene in Ohio State University, states that an analogy should be drawn from sea life and a precept

* A theory or system founded by John Brown, who maintained that all diseases are the result either of an excess or of a deficiency in the excitability of the animal system. E. G. E.

taken from evolution; inland dwellers should look to sea water as their dependable source of iodine. Continuing, he submits:

"This substitution would appear to offer a complete solution to the iodine deficiency problem, if nothing else, while evidence would tend to show that other constituents of sea water have also an undoubted place in the economy of the higher animal organism, perhaps to the extent of precluding some diseases which are likewise, possibly, of a deficiency type. Common salt for dietary purposes should include not only sodium chloride but also sodium iodide, and undoubtedly many of its other original concomitants."

After considering the subject and giving many references relating to the use of iodine in the prevention of goiter and associated conditions; its infrequency in maritime districts; the geochemistry of salts and the sources and preparation of common salt, the author comes to this conclusion,—if land animals, including man, must have iodine as a necessary content of their food intake, its one reliable source is sea water which, however, must be handled and provided in a manner to retain the iodine, and this probably in its organic form; and further on in the article he presents this question: "Should not total sea salts or, indeed, plain sea water, be used as the proper and complete condiment for man and land animals? It must be remembered that it contains not only the two discussed essentials, sodium chloride and sodium iodide, but also many other physiologically important salts and salines. It is not poisonous. It can be filtered free of foreign matter, even bacteria. Plants and animals, both sea and land forms, show a selective action for such elements as they need for their economic processes." He also asks: "May not the absence of bromine from our usual food intake play an important part in the occurrence of various excito-motor conditions?"

The main question involved is not a new one, as evidenced by the numerous references noted by the author, and during past years several editorials on the iodine value in foods have appeared in the *Journal of the American Medical Association*. The author of this paper presents the subject in a somewhat different way, and he makes the suggestion quoted, that sea water or the total of its salts be used as the proper and complete condiment for man; others have advocated the addition to salt of sodium iodide, 1 to 5,000, for the use of human beings. Our comment has largely been prompted by the space given to the article in the *New York Times* of January 22. E. G. E.

AS IT SEEMS TO US.

THERE is no intention to present a political discussion, which has no place in the Association or its official organ, but we are all concerned in the solution of problems before Congress and in the betterment of conditions, so that we may reach normalcy, and have our industries and commerce grow as they should under the advantages that this country possesses. According to many, one reason for the hindrance of progress in national affairs is that *pro bono publico* receives less consideration than political contention, which not only neutralizes the energies of legislators in the work before them, but creates public unrest, and the uncertainties of legislation are harmful to labor and capital. What is needed is co-

ordinated effort; the public is willing for a time to overlook party advancement and give those credit who formulate working plans regardless of the party to which they may belong. The War possibly would not have been won without unity of action; it is probable that none of the nations could have succeeded without such spirit. We are generally agreed that parties would not continue in strength unless their interest is that of the country; they may differ on ways and means, but among thinking men, in a readjustment period, there must be a way of arriving at conclusions unless selfishness, prejudice, antagonism and hostility prevent. The purpose of a good American legislator is to serve, but his vision is sometimes blinded by obligations.

The Hon. Thomas B. Marshall recently said, in substance, in another connection, which may find application in this comment, that in the midst of a political campaign he had an inherent right to be a party man by voice and vote; the expression of sentiments as to the good of the country is guaranteed by nature and by law, but above this inherent right arises a solemn duty as an American.

The Hon. Lloyd George, in a recent speech, speaking for national unity, said: "***When I say national unity is necessary it is because I believe in all consciousness it is essential until the country is restored to something like normal conditions. ***What is there to quarrel about? Private enterprise, the resistance to revolutionary policy, to the overthrow of the individual enterprise that has made this country? What is the difference between Liberals and Conservatives there? The Liberal says, 'I believe in freedom, therefore I am opposed to fettering industry with any such regulations. I am therefore for private and individual enterprise.' That is the way he approaches the question. The Conservative says, 'I am in favor of maintaining the institutions that have created the greatness and prosperity of this country. I consider private enterprise to be one of them. I approach it from that point of view.' But they are both serving the same purpose."

So here and there we have similar conditions and viewpoints, while in the halls of Congress new problems are presented affecting the Treasury without providing over-burdensome means for taking care of those under consideration nor shaping adequate legislation that will be incentive and encourage manufacture and commerce. The prosperity of the nation is the combined prosperity of its individuals. "Legislation follows real or supposed public sentiment. What we need as a people is to learn that prosperity for one means prosperity for all. Regulation if wise and free from politics should be welcomed." Speaking pharmaceutically, it seems to us the country needs a penetrating liniment more than warm poultices or political emollients. E. G. E.

PHARMACEUTICAL PROGRESS AND THE CHEMICAL INDUSTRIES.

MUCH has been written about the chemical industries in their relation to medicine; as a matter of fact, pharmaceutical application of the chemicals and search by pharmacists for a better and more extensive materia medica have contributed largely to our knowledge of chemistry. That thereafter more extensive use was made of the chemicals for other purposes simply adds greater credit to the service of pharmacy, without detracting from that given by other professions and

industries; in fact, these have grown up and developed under the stimulation one provided for the other.

The progress of pharmacy depends in a large degree on that of its correlated professions and industries; with some of these the interdependence is so nearly complete that it is difficult to discern the dividing lines; the same is true of research in these activities. "American Pharmacy," in many places throughout the report on "The Future Independence and Progress of American Medicine in the Age of Chemistry," could replace the names of "American Medicine" and "American Chemistry"—safeguarding the American chemical industries will contribute largely to the advancement of pharmacy; research in the sciences will bind together the industries, technical schools and universities—it has a coöperative influence or force.

The vision of professional men and others engaged in the industries is broadening—there is a growing realization of their opportunities and that better results follow their work with more intimate knowledge of what is needed in practice and of what the laboratories produce; that they are coöperators, and the professions do not lose standing by such contact; one is essential to the other—application cannot precede production, and production is useless unless use is made of the product. The Conference idea is a coöperative one, its effectiveness is based on truth; the same is true of the relation which it has been attempted to outline. It is unnecessary and it may be very difficult to figure the unit value of the work of a physician who applies, for comparison with that of the one who discovers the agent or prepares it, but there is a relation. All, including the laymen, will benefit greatly by the coöperation of the hospital, doctor, pharmacist, chemist and the laboratory. Incentive, motive and conditions differ in these activities, but the influences extend to the health and prosperity of the country, and we might say protection, for many of the medicinal agents and the manufactories for them are readily convertible to serve such purposes, as was shown during the war. The statement has been made that a soldier may carry a flag, dyed with the chemical explosive that wounds him, and the wound thereafter be antisepticized with it.

The questions bearing on safeguarding the American medicinal chemical industries are many and important, and what is said of the chemicals applies in a way to items not usually classed as such; in many pharmacy and medicine have a deep interest, and theirs is also largely that of those served by them. The remarkable results obtained by American pharmacists and chemists during the past few years speaks well for their education, training and ingenuity; the fact that the prices of many chemicals and dyes are lower than before the war evidences that our American manufacturers do not seek the gain others have exacted. But now there is a foreboding of an uneven contest between American and foreign manufacturers, and it is a question in which every pharmacist and everyone interested in pharmacy as a science is vitally concerned.

The limitations of this comment preclude the bringing in of details relative to pre-war and present conditions; but much has been said and written about the expense of maintaining research laboratories and cost involved in perfecting a product. With that must be considered the difference in American wages and those of other countries, and prevailing conditions. It is largely a question of whether

the American medicinal chemical industries shall be protected during a period of development; probably no other industry offers greater benefits to art and science, if not to commerce; without protection much of the work accomplished will represent a loss. The manufacture of medicinal chemicals will stimulate research; that it has done so is the proof of the assertion; this in turn encourages the establishment of research laboratories in schools and in manufacturing establishments, and from here the influences extend to every activity and seat of learning.

The United States has proven that it is big in every way, especially big enough to be generous and fair; its resources are large, and it has the brains and ingenuity that can convert them into useful and usable material. As a general proposition there is disinclination to protect manufacturing industries, but in this instance we have what for America is a new venture and an undertaking that requires time and much capital to place it on a footing to compete with other nations, and this really is a minor phase; the benefits therefrom, as has been indicated, are most important because of the influence these industries exert in other directions; pharmacy is affected in many ways; pharmaceutical organizations are on record for protection of these industries, and pharmacists have opportunities to acquaint the public with the need of it—"the cards can be laid on the table, face up." E. G. E.

ELECTION OF OFFICERS OF AMERICAN PHARMACEUTICAL ASSOCIATION, 1922.

Chairman Fuller, of the Board of Canvassers, A. Ph. A., reports that there were 1,462 votes cast in the recent election, resulting in the election of the following officers, who will be installed at the Cleveland Convention, August 1922:

President, Julius A. Koch, Pittsburgh, Pa. *First Vice-President*, E. N. Gathercoal, Chicago, Ill. *Second Vice-President*, Lyman F. Kebler, Washington, D. C. *Third Vice-President*, Clyde L. Eddy, New York, N. Y. *Members of the Council*, Charles E. Caspari, St. Louis, Mo., S. L. Hilton, Washington, D. C., W. L. Scoville, Detroit, Mich.

THE FAIRCHILD SCHOLARSHIP FOR 1922.

The members of the American Conference of Pharmaceutical Faculties and the National Association of Boards of Pharmacy are respectfully requested to read the report of the Fairchild Scholarship Committee, pp. 710–712, September 1921, JOURNAL A. PH. A., and also the remarks relative thereto in the December number, pp. 987–988.

Please communicate to the Chairman your views regarding the subjects in which the candidates should be examined. There is a possibility of applicants for the award who, although they have only concluded their first year in a Pharmacy School, have had a premedical course, or pursued studies in chemistry or other subjects, which gives them an advantage over the average one-year pharmacy student. Can this be prevented—is it desirable to exclude such students, and what should be the action of the Committee?

The Fairchild Scholarship Committee welcomes your suggestions; their desire is to handle this matter in a way that will be generally acceptable, or as nearly so as possible.

Please respond promptly, for the first year of work of pharmacy students is coming to a close. Also give your preferred date for holding the examination; June 12th is suggested.

Thanking you for coöperation,

Glad to be of service,

E. G. Eberle, *Chairman*,
Fairchild Scholarship Committee.

INVESTIGATION OF PURIFIED SILICEOUS EARTH.*

BY W. G. CROCKETT.

The work embodied in this paper has been done at the request of Dr. H. V. Arny, with hopes that it might be of help to the Committee of Revision of the Pharmacopoeia in establishing new standards for this product in the next edition, or else deleting it entirely.

The first problem which presented itself was that of obtaining samples of the material. Personal letters were written to members of the Association residing in different parts of the country, requesting that they furnish the writer with samples obtained from as many different sources as possible. This brought out the fact that in many parts of the country it cannot be obtained and furthermore, when carried in stock, is not known, as a rule, by its official title, but is sold under the names "Kieselguhr" or "Infusorial Earth."

It could not be obtained in New Orleans, Cleveland or Richmond. Samples were ordered from two jobbers in New York with the result that one shipped "talc" and the other "kaolin." Only one wholesaler in Utah could furnish it and his product was bought ten years ago. Out of three wholesalers in Pittsburgh, only one could furnish it.

It might be of interest to note that the following question was asked recently in a State board examination: "Kieselguhr—give its official title, chemical composition, and uses." Out of the twenty-three candidates, twenty-one ignored the question entirely, one said it is a German name for "Carslbad salts," while the other stated that it is purified siliceous earth, but made no further comment.

An exhaustive search yielded nine samples, which came from the following cities: Philadelphia, Baltimore, Boston, Chicago (two samples), Pittsburgh, Detroit, New York, and Ogden, Utah. As one sample is a spurious product which consists of a mixture of siliceous earth and calcium carbonate it is eliminated, and not recorded in the results below.

Analytical Data.

Table 1.

Sample	Fineness of powder.	Odor.	Loss on ignition.	Organic matter.	Carbonate in 1 Gm.	Sulphate in 1 Gm.	Iron in 0.05 Gm.
1	Very fine	None	4.8%	None	None	None	Present
2	Very fine	None	0.56%	None	None	None	Present
3	Very fine	None	10.00%	Present	None	None	Present
4	Gritty	None	11.30%	Present	None	None	Present
5	Very fine	None	8.60%	Trace	None	None	Present
6	Very fine	None	0.78%	None	None	None	Present
7	Gritty	Slight aromatic	4.0%	Trace	None	None	Present
8	Gritty	Sour milk	7.2%	Present	None	None	Present

Table 2.

Color of filtrate when 1 Gm. of sample is boiled with 25 cc dilute hydrochloric acid and filtered (should be colorless).

Number	1	2	3	4	5	6	7	8
Color	Slight yellow	Intense yellow	Intense yellow	Intense yellow	Intense yellow	Slight yellow	Intense yellow	Intense yellow

* Read before Scientific Section, A. Ph. A., New Orleans meeting, 1921.

TABLE 3.

Digest 1 Gm. of sample for 15 minutes with 20 cc dilute hydrochloric acid and filter; 10 cc of filtrate when evaporated to dryness and ignited should not leave a residue weighing more than 0 005 Gm.

Number	1	2	3	4	5	6	7	8
Residue	0.0043	0.0030	0.0042	0.0058	0.0070	0.0047	0.0037	0.0034

TABLE 4.

Boil 10 Gm. of sample with 50 cc distilled water and filter. Filtrate should be colorless and neutral to litmus.

Number	1	2	3	4	5	6	7	8
Test	Turbid neutral	Turbid neutral	Turbid neutral	Slight yellow neutral	Turbid neutral	Turbid neutral	Turbid neutral	Colorless neutral

The turbidity in above filtrates is due to presence of colloidal silica, which even passes through doubled quantitative filter papers.

SUMMARY.

Not one of the samples submitted conforms to the requirements of the United States Pharmacopoeia.

One sample is too highly adulterated to justify consideration and is not included in this report.

Each sample contains more than twenty times the quantity of iron permitted by the U. S. P.

Five samples (Nos. 3, 4, 5, 7 and 8) show darkening on ignition (organic matter).

When one Gm. of sample is boiled with dilute hydrochloric acid and filtered the filtrate is yellow in each case, showing excess of iron.

In two samples (Nos. 4 and 5) the matter soluble in dilute hydrochloric acid exceeds that permitted by the U. S. P.

Six samples (Nos. 1, 2, 3, 5, 6 and 7) yield turbid filtrates after being shaken with water.

Three samples (Nos. 4, 7 and 8) are not fine powders but are gritty, due to the presence of a considerable quantity of sand.

Sample No. 8 has a foreign and disagreeable odor.

Sample No. 4 shows excessive loss on ignition.

CONCLUSIONS.

1. Purified siliceous earth is a rare product and cannot be obtained at the present time from our wholesale druggists.

2. While in a few isolated cases it may be supplied by them, it is of inferior quality and not suitable for use as a filtering medium, due to the fact that it contains an excess of iron and also colloidal silica, the latter of which produces turbid filtrates—thus defeating the purpose for which it is used.

3. Its use as a filtering medium is not compulsory, since the Pharmacopoeia merely states that it *may* be used to replace talc in preparing the official waters.

4. For reasons given, the writer does not believe this product to be deserving of recognition in the next revision of the Pharmacopoeia, and respectfully recommends to the Committee of Revision that it be deleted.

RESEARCH LABORATORY,
SCHOOL OF PHARMACY,
MEDICAL COLLEGE OF VIRGINIA.

ABSTRACT OF DISCUSSION.

H. H. Schaefer inquired whether Mr. Crockett had made any attempt to purify the siliceous earth; whether the product was obtainable with difficulty because it was not being imported to any great extent, and whether it was not likely that in the near future if there was demand there would be an ample supply on the market.

Mr. Crockett answered that the purified siliceous earth had been formerly imported from Germany; there were large deposits in this country but it seemed impracticable to purify the native product which does not conform to the requirements of the U. S. Pharmacopoeia. He further stated that part of the City of Richmond was built on this deposit.

W. L. Scoville was not prepared to vote on the question of recommending the deletion of purified siliceous earth from the Pharmacopoeia. There is a plentiful supply of it in this country; the need is that it be purified. In his opinion the pharmacist could use other substances to better advantage but it is used in filter presses by manufacturing pharmacists and they obtain better results with it economically and otherwise than by use of other substances.

DEHYDRATED PRODUCTS IN COMMERCE AND IN THE SCIENCES.*

BY LOUIS GERSHENFELD.

One of the oldest and perhaps one of the best methods practiced in the preservation of foodstuffs, drugs, etc., is the use of the process of desiccation. Within recent years the latter method has been extensively employed in the arts and sciences, not only because of the fact that the use of preservatives becomes unnecessary and that a great expense in transportation and storage is saved, but also due to the fact that numerous compounds can be made available for the laity, commerce, and for the scientist, which, merely by the addition of water, will result in the production of a desired end-product.

It will be impossible to cover in detail in a brief article the many products that may be included under this head; however, the important ones will be mentioned and facts which may be of interest to all will be included.

That dehydration is an effective method for the preservation of material was recognized by the ancients in the treatment of various fruits; it will, therefore, be advisable to first consider substances which may be regarded as foodstuffs, that are so treated to rid them of moisture. It may also be mentioned that the recent world war has given impetus to the preparation of dried fruits and vegetables, because of the saving in storage, handling, transportation, etc.

There seems to be a marked differentiation between what one may term a dehydrated product and an evaporated substance. Some are inclined to use the term dehydration only when the drying has been carefully controlled, and evaporation as a term applied to substances which are dried at a high temperature (over 160° F.), one which is not carefully controlled by any specific mechanism.

The following fruits and vegetables may be mentioned as dehydrated or evaporated products that are obtainable in the market:

Apples, apricots, beans, cherries, citron, cowpeas, currants, dates, figs, grapes, lentils, peaches, peas, pears, prunes, raspberries, raisins and tomatoes. These make possible a diet of many fruits and vegetables all the year round, irrespective of climatic conditions or season.

There are two distinct methods practiced in the production of these substances, (*a*) sun drying, (*b*) evaporation. Sun drying (an ancient process) is carried out in those regions that are free from rain and excessive moisture during the drying

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* Presented to Scientific Section, A. Ph. A., New Orleans meeting, 1921.

season. The fruits and vegetables are given a preliminary treatment prior to a sulphur bath, which acts as a sterilizing agent. They are then placed in trays or suitable containers in the sun. In favorable weather, six or seven days are required for thorough curing. The preliminary treatment consists in cleaning the fruit or vegetable, cutting them in some cases (peaches, apricots), peeling, coring, cutting or slicing in other instances, as is done with apples, pears, etc. Certain fruits, as raisins and prunes, are first dipped in a hot weak solution of potash. This acts on the skin, removing the bloom, thus facilitating drying. In California the open air sun-drying method is carried out extensively.

The evaporation process is beginning to supersede the air-drying process. The following important improvements are claimed for artificial evaporation (a process which is still in its infancy): (*a*) less bleaching with sulphur is required, (*b*) one is not dependent upon weather conditions, the process is under control at all times, (*c*) less space is required for proportionate larger quantities of material than in the sun-drying process, (*d*) the end-product is cleaner and less liable to insect injury, (*e*) they appear more attractive than air-dried products, possessing a better quality and flavor, (*f*) they are always ready for immediate packing. The only disadvantage thus far has been—the cost of the evaporators is so high that the evaporated material is usually more expensive than the corresponding sun-dried fruits and vegetables. The former will be marketed in large enough quantities, providing the laity is willing to pay a little more money for a product which seems to possess superior qualities.

Evaporated or dried fruits and vegetables will keep their flavors for a long time if kept in a cool, dry place. Exposed to dampness they quickly become sour or molds develop. They will retain their flavor even if less than 8 percent of moisture is present. When the latter reaches over 22 percent the vegetables or fruits begin to spoil. In preparing dried fruits best results are obtained by adding enough water to cover them, and then cooking for a few hours at a temperature just below the boiling point.

Dried Meats.—Dried meats as a foodstuff have been employed in various regions. Meat cut into strips and exposed to dry air and sunlight has been found to retain all the nutrient properties, and, when properly cooked, the resultant product is found to be palatable.

There are also found on the market to-day many preparations under trade-marked names, which consist of dried and finely ground meats, either in their natural state of desiccation, admixed with other substances, or prepared with some degree of artificial digestion.

Mention may be made here of solid meat extracts. The latter are employed by the laity as a stimulant and condiment, and by the scientist they are used extensively for the preparation of culture media. Meat freed from superfluous fat and bone is extracted with water at a temperature which varies in the different processes. The liquid extract is then concentrated in vacuum kettles until pasty or solid extracts are obtained. The latter are not entirely free from water, containing anywhere from 10 to 20 percent of moisture. On account of the large amount of mineral constituents, due to concentration and the small amount of moisture remaining, the conditions are not such as to maintain the life of the commonly found bacteria that cause fermentation.

So-called dried soups are commonly found marketed as efficient stimulants. These products are usually shaped into cubes, and consist either of meat extract alone or of several varieties of dried vegetables, cut and mixed with dried herbs as flavoring agents, a small amount of gelatin, and a meat basis.

Milk.—The drying of milk and the reduction of the product to a powder has recently been introduced on a very large scale in this country. Desiccated milk was first produced from skim milk and supplied mainly to bakers and confectioners. This was used either in a dry state or brought back to its original condition by adding the amount of water extracted from it.

Whole dry milk has been brought to the attention of the American public probably more so by the recent advertisements of "Klim." By removing the water from milk under such conditions that the soluble principles in the milk are not coagulated during the drying process, a product will be produced, which, when kept in airtight containers, will keep for a long time and can readily be restored to its normal state by the addition of the proper amount of water. Considering that liquid milk contains about 88 percent of water, one can readily see the great economy in so far as saving in transportation is concerned, as well as in the fact that the sanitary regulations can be guarded more closely than can be observed in the marketing of liquid milk. Two methods are mainly employed in converting cows' milk into a dry powder. In one, the milk in form of a spray is forced into a chamber of hot air. The air currents by driving the dry particles against a screen hold the solid portions and the air is allowed to pass on. In the other method, the milk is caused to adhere in a film on heated cylinders (or on metal plates *in vacuo*). As the cylinders revolve, the dried milk is scraped off. The latter is collected, subjected to further drying if necessary, and reduced to a fine powder. In both methods the milk is usually condensed in a vacuum pan, before entering the drying machines.

The keeping qualities of dry whole milk are not as good as dry skim milk. In the case of the former, if it is allowed to come in contact with the air, the fat becomes rancid, and then the fine flavor and freshness, characteristic of cows' milk, is lost. Dry whole milk usually contains anywhere from 25 to 30 percent of fat, and some cases have been reported where as high as 40 percent of fat has been found.

Dried Eggs.—The processes of evaporation and desiccation of eggs have received a greater impetus as a method of preservation, more so since the latter method was employed as a better means of storing and utilizing eggs to the best advantage. Dry egg products made from fresh eggs can be kept for a reasonable length of time if the proper precautions are observed. The method used in drying is usually one in which the eggs are spread in a thin film on a dry surface or by forcing the eggs into a chamber of hot air, as described under milk. The temperature during drying is kept below 50° C. so as to prevent coagulation of the albumen. Some manufacturers add salt or sugar or both to aid in preservation.

Dry eggs are employed by bakers, confectioners, etc. There have been more adulteration and misbranding in the marketing of so-called dry eggs than in any other desiccated or evaporated product thus far introduced. Various protein materials or starchy substances colored yellow have been and are marketed as egg powders,

and offered to the laity for baking, etc. They contain in some instances only the whites or yolks, and in many of the samples no egg at all is found. As such they are to be regarded as adulterations.

Other Dried Foodstuffs.—Dried fish (especially herring, mackerel and cod) are used extensively by the American public. This makes a wholesome and delicate dish. The drying of fish as a process of preservation is an ancient one. Many varieties of fish (as well as meat) change in physical appearance during the drying process, becoming less attractive as a foodstuff.

Many trade-marked products are available in which the basis is gelatin admixed with flavoring agents and other substances. These, when mixed with water to which is added sugar and flavors, are employed as a dessert in many localities.

There are marketed so-called powdered puddings, pan-cake flour with powdered buttermilk, and a host of other trade-marked formulas which result in the production of delicious end-products, after the proper amount of water is added, and heat applied if necessary. Are not biscuits, crackers, macaroni and noodles dried products?

May we not regard as a dried product that substance for which we Americans are chided by our European brethren—chewing gum? This is a chopped or finely ground chicle which is boiled to the proper consistency; sugar and flavoring are added and the mixture is kneaded into a dough. The latter is worked, passed between revolving rollers and cut into the desired shapes and sizes; it is then dried and wrapped. Mention may also be made of dry cocoanuts, and hard candies.

Without going into further detail, one can readily observe the large and ever-increasing numbers of these dried products that are being employed as foodstuffs, and still look forward to many additions that will revolutionize marketing conditions. But as in all changes, new problems are usually encountered. The sanitarians should proceed to caution manufacturers of the many regulations that are to be heeded. The temperatures employed in the drying process are not sterilizing temperatures. It is therefore of the utmost importance *to closely supervise the sanitary conditions of the plant where the products are being made. Factory inspections are more desirable and of greater importance than the examination of the unadulterated end-products.*

Dehydrated Products in the Sciences.—The pharmacist was perhaps one of the first to employ drying for the preservation and the reduction of the bulk of material; he and the chemist began to employ this process as a means of arriving at uniformity in the strength of products.

Just as in foodstuffs, the ancient method of sun-drying is still practiced in various regions for the drying of drugs (by exposing them to the action of the rays of the sun). The use of artificial heat alone or with the aid of vacuum apparatus is employed more extensively for the drying of drugs and chemicals, and in the reduction of the bulk of liquid extracts to semi-solid or solid extracts.

Following pharmacists and chemists, other scientists began to use the process of drying for the preparation of material. Dried immunized blood sera (the sera obtained from animals immunized against specific bacteria, and dried *in vacuo*) are valuable agents in the clinical and bacteriological laboratory, used for the identification of the many varied microörganisms that possess almost identical

characteristics. Dried and powdered blood, other than being used in the food supply, has recently been marketed (usually admixed with other material) as a valuable product to increase the coagulation time of blood.

One of the most important uses of dehydrated products, a value which will be displayed more and more in the future, other than the fact that there is a reduction in bulk, a saving in handling and the preservation of material, is that preparations of simple and complex formulas of *accurate strength* will be quickly available by the addition of the proper amount of water and subsequent heating, baking or sterilization.

Mention was made (when foodstuffs were discussed) of the various formulas that are available in which puddings, desserts, and even ice cream and cake, can be quickly prepared; it remained for the bacteriologist to perfect dried products to a still higher degree of usefulness. He, in his search for simple formulas and short cuts in the technique of the many varied preparations that may be required in investigations, introduced the so-called "*Dehydrated Culture Media.*"

"Dehydrated Culture Media" are media in a dried powdered form ready to be prepared into various liquid or solid media by merely restoring the moisture with distilled water and sterilizing the end-product. The advantage of these products is in the fact that it is possible to obtain anywhere at any time any quantity of a medium of a constant adjusted reaction or hydrogen ion concentration, which will be identical in composition and reaction with all other lots of the same medium prepared on a previous occasion. The dehydrated media have also made possible the more extensive use of many of the media of special formulas or media fortified with natural fluids. As a dry powder, they are kept in containers which, if tight, will preserve the contents indefinitely.

The writer's thought in preparing this paper was to direct attention to the wide use of these dehydrated products, so that pharmacists would know more about the application of desiccation to products other than pharmaceutical.

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SOME NOTES ON THE ASTRINGENCIES OF RED ROSE AND PALE ROSE.*

BY JOSIAH C. AND BERTHA L. DE G. PEACOCK.

Last year a paper entitled "The Tannin of Red Rose" was read before this body. In it were discussed the properties of that astringent principle with the result that characteristic differences from other known astringent principles were shown.

Because of the interesting features of this constituent of Red Rose, an examination of Pale Rose was undertaken for report to this meeting.

Concerning the presence of a "tannin" in Pale Rose there seems to have been doubt, for, though some authors state positively its existence in small amounts, Maisch, in his "Manual of Organic Materia Medica," 1892, gives as constituents, "Little volatile oil, mucilage, sugar, tannin (quercitrin?), malates, etc." Certain it is that the matter had not attracted the necessary attention to decide this question.

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* Read before Pennsylvania State Pharmaceutical Association, 1921.

It is very natural to base one's inference regarding the presence and relative amount of "tannin" on the simple test of taste, as mentioned last year, when it was pointed out that the astringency and bitterness of Red Rose are experienced simultaneously and are about equally pronounced. This description, however, does not apply to Pale Rose, which is strikingly bitter rather than astringent.

It is desirable, for the sake of a proper understanding, to state at once that "the tannin of Red Rose" is present in Pale Rose as well, but in a very much less proportion.

A fair impression of this amount may be gathered from the fact that a kilo of Pale Rose did not yield sufficient to permit of the "tannin" being entirely separated from adhering matter, while the same weight of Red Rose gave an abundant sample of the purified principle.

In the case of Pale Rose, as in Red Rose, the presence and close association of much larger amounts of the "quercitrin" of other observers makes the isolation of the astringent principle both tedious and wasteful.

For a proper comparison of the following notes on Pale Rose, reference should be had to the article of last year on Red Rose.

When Pale Rose was boiled with successive portions of water, the reddish color of the material and the bitterness were entirely removed and they failed to reappear upon subsequent drying of the undissolved portion. The infusion was feebly acid to litmus. While the first impression made by this infusion on taste was of bitterness, the last was plainly of astringency. Diluted sulphuric acid developed a reddish color and a distinct opalescence in the infusion. Upon boiling, a precipitate of burr-like aggregates was formed, identical in appearance and properties with those obtained through like treatment of Red Rose.

Except for the much smaller proportion of astringency and the relatively greater bitterness, the physical properties of the infusions of the two roses were found to be very similar, while behavior toward reagents further demonstrated a similarity of ingredients. For instance, from the infusion of Pale Rose, as from that of Red Rose, hide powder removed all astringency and bitterness; all acidity to litmus; and all color except a straw-yellow. The resultant fluid was changed to pink by the addition of diluted sulphuric acid.

In an attempt to isolate and purify the astringent substance, the bulk of the infusion was concentrated, cooled and shaken with acetic ether, which solvent removed the greater part of the astringent principle, as subsequently found through the failure of diluted acid to produce in this liquid the burr-like aggregates upon heating.

The recovery of the acetic ether yielded a small amount of thick syrupy residue; it consisted of the astringent principle and the substance which others have called "quercitrin." Efforts to obtain the "tannin" in a porous condition were unsuccessful, in operating upon this quantity. But it was converted into scale form by dissolving in alcohol and evaporating with heat on an enameled surface.

Although the purification was not an entire success, the material by displaying the peculiar properties of "the tannin of Red Rose" in its behavior toward reagents, proved its identity with that substance. Especially was this fact established by the production of the burr-like aggregates when the solution of the principle was treated, hot or cold, with diluted mineral acids.

There is every reason to believe that this astringent substance is present in both drugs, but in very much smaller quantity in Pale Rose, perhaps less than one percent of its weight.

As it is becoming more and more evident that astringency is not a characteristic of any one substance, no more than the property of bitterness is indicative of any single material or group of them, we question the desirability of continuing to apply to such principles (other than gallotannic acid) the names "tannic acid and tannin." Instead, as a means of obviating a possibly improper terminology, the suggestion is offered that such plant substances may well be grouped under the name of "astringents," with a prefix to indicate the source; as for example: quercastringent; rosastringent; etc.; until they are chemically classified, and even then a name so practical as these may be preferable to an intricate one which details the chemical structure of the substance.

EFFECT OF MILDEW UPON RED ROSE AND PALE ROSE.

Another feature of the paper presented in 1920 was a reference to a crystalline principle which seemed to develop under the influence of mildew growth upon an unstrained infusion of Red Rose. By means of an ether extraction of these materials this substance was obtained in fine white or colorless crystals, but in very small amount.

To further study this matter, and more especially at this time to confirm this behavior, about 500 grams of Red Rose were exhausted with ether to remove any preëxistent ether-soluble contents.

This treatment revealed the presence of fatty and waxy constituents and of a crystalline substance having the same appearance and solubilities as the one being sought.

Continuing the experiment the ether exhausted residue (unchanged in appearance) was freed of this solvent, and mixed with water into a mush, which was exposed to induce a growth of mildew.

In the course of two weeks, the surface was covered with a thick layer of mycelium. This covering was removed with as little of the Red Rose as possible, and extracted with ether; which removed but a trifle of the crystalline substance.

The mush was then strained to separate the aqueous portion and this clarified by further straining. This liquid was of deep wine-red color, strongly acid to litmus, astringent, bitter, and decidedly musty, but still strongly suggestive of rose. Ether shaken with this fluid removed the crystalline principle, thus confirming its formation under the circumstances arranged for. From this portion of the mush, the yield was several times what ether extracted directly from the Red Rose.

It is presumable that this crystalline substance is derived from some water-soluble constituent of the rose, whether the "tannin" or not. To examine this subject, the solid portion of the mush was washed with cold water while every color was removable; then mixed again with water and the resulting mush exposed to induce mildew as before. The development of mildew was very slow and sparse compared with its appearance and amount in the previous experiment. The watery portion was found to contain none of the crystalline principle.

The same experiments were carried out on Pale Rose with the result that a small quantity of a crystalline substance apparently the same as that from Red Rose was directly extracted by ether; while a less amount was obtained in the experiment with mildew.

These experiments will be repeated to determine whether the crystals will develop in the mush without the appearance of mildew.

It is within the bounds of probability that this crystalline substance is related to the astringent principle.

The solubility of this crystalline principle in chloroform distinguishes it completely from the substance which forms the burr-like aggregates when the solution of the astringent principle is treated with acid.

The burr-like aggregates melt when heated and sublime in the same crystalline form, tending to assume this peculiar manner of association.

PEYOTE, THE NARCOTIC MESCAL BUTTON OF THE INDIANS.

BY W. E. SAFFORD, PH.D.*

Peyote is a small, fleshy, spineless cactus which has been used for centuries by aboriginal Americans in connection with their religious rituals and as a magic plant believed to have the power of inducing supernatural visions. By most laymen the name cactus is loosely applied to almost any spiny plant of the arid regions of our Southwest. Indeed, the Greek κακτος, from which Linnaeus adopted the name cactus, was the spiny wild artichoke, or cardoon (*Cynara cardunculus*) not at all related to the botanical family Cactaceae, which is essentially American and had no representatives in the Old World until after the discovery of America. Plants are classified by the structure of their flowers and fruit, not by their general appearanee or their habit of growth; the peyote, though quite devoid of spines, is a true cactus. It was first referred to the genus Echinocactus, afterward to Anhalonium, and finally was made the type of a new genus, Lophophora. The various generic names are probably the cause of the erroneous idea that a number of species of narcotic cacti are used by the Indians. As a matter of fact there is but one species, *Lophophora williamsii*, so used. This species varies in the arrangement of its tubercles. One form of it was called *Anhalonium lewinii* by Hennings in 1888; but the latter was shown by Professor Coulter to be only a variety of *Lophophora williamsii*, a species first described under the name *Echinocactus williamsii* in 1845 by Lemaire, the distinguished authority on Cactaceae.

Dr. Thomas S. Blair,[1] chief of the Bureau of Drug Control, Pennsylvania Department of Health, recently published a paper in *The Journal A. M. A.* in which he states that he has not succeeded in finding a botanic description of the narcotic peyote plant in any of our American works on botany. For a description of this plant, of both the typical form *Lophophora williamsii* and its variety *lewinii*, I would refer the reader to a paper by John M. Coulter.[2] In this paper Dr. Coulter

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* Economic Botanist, Bureau of Plant Industry, United States Department of Agriculture. Reprinted from *Journal A. M. A.*, Oct. 15, 1921.

[1] T. S. Blair, "Habit Indulgence in Certain Cactaceous Plants among the Indians," *J. A. M. A.*, 76, 1033, April 9, 1921.

[2] J. M. Coulter, "Preliminary Revision of the North American Species of Cactus, Anhalonium, and Lophophora," Contributions from the United States National Herbarium 3, 91–132, June 10, 1894.

states that he found the form with irregularly arranged tubercles, named in honor of the chemist Dr. Lewin of Berlin, to be connected with the typical *Lophophora williamsii* by such complete intergradation that it was impossible to separate the two forms as distinct species. This intergradation was shown by a great number of living specimens in the Missouri Botanical Garden. Dr. Coulter's observations have since been confirmed by Dr. J. N. Rose of the Carnegie Foundation. I shall not here quote the botanic descriptions of the type and its variety. The intergradation between the typical forms *Lophophora williamsii* and the variety *lewinii* may be seen at a glance The flowers of these two forms are indistinguishable.

The earliest description we have of the peyote plant is that of Hernandez, a learned Spanish physician sent in the sixteenth century by his sovereign, Philip II, to make a study of the resources of New Spain. He characterizes it as a root "of nearly medium size sending forth no branches or leaves above ground, but with a certain woolliness adhering to it;" and he adds: "Marvelous virtues are attributed to it by the Indians (if any faith can be given to what is commonly said among them on this point). It enables those eating it to foresee and prophesy such things, for instance, as whether on the following day the enemy will make an attack upon them, or whether the weather will continue favorable; or to discern who has stolen from them missing objects, and other things of like nature which the Chichimecas really believe they have the power of divining. On this account the plant scarcely issues above the surface of the ground, but hides itself as though unwilling to harm those who may discover and eat of it."[1]

Peyote grew, and still grows, in northern Mexico in what is now the state of Zacatecas, and also in Chihuahua and on both sides of the Rio Grande not far from Laredo, Texas. Its collection was formerly accompanied by ceremonies recalling those observed by early herbalists of the Old World in collecting certain medicinal plants. It was dried and preserved either in longitudinal strips called *raiz diabolica* (devil's root) or in disks resembling mushrooms called *teonanacatl* (god's flesh, or sacred mushrooms). Padre Sahagun,[2] writing in 1575, states that it was commonly eaten by the wild Indians of the north called Chichimecas, giving them courage to fight and rendering them insensible to the pangs of hunger and thirst, as well as protecting them, as they believed, from all danger. Padre José Ortega, writing before 1700, described the ceremonial of the peyote, accompanied by singing and dancing throughout the entire night and resulting in the intoxication of those who partook of the drug.

The early Catholic missionaries were opposed to peyote, not so much on account of its physical effects on the Indians as because it was connected with the rituals of their religion, and kept them from embracing Christianity. It was forbidden by law, and to partake of it was regarded almost as great a crime as cannibalism. In one of the early manuals for the administration of the sacraments of the Indians, the following questions were asked: "Hast thou eaten flesh of man? Hast thou eaten peyote?"

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[1] Hernandez, *De Historia Plantarum Novae Hispaniae, Francisco Hernando Medico atque Historico Philippi II. Hispaniae et Indiarum Regis; et totius Novi Orbis Medico Primario, Auctore*, Madrid, 3, 70, 1790.

[2] Bernardino Sahagun, *Historia general de las cosas de Nueva España, Edicion Bustamente*, 3, 70.

NARCOTICS AND INTOXICANTS USED BY INDIANS.

In my investigation of the narcotics and intoxicants used by the American Indians, I have found that alcoholic drinks have been their greatest curse. The principal sources of these have been the Mexican maguey or century plant, and the sotol of the southwestern United States and Northern Mexico. In addition to those intoxicants, certain drinks called tizwin (from the Aztec *tehuino*, intoxicating) were formerly brewed in the Southwest from malted maize or other grain, and in South America fermented drinks were prepared from maize and the roots of mandioca. The effects of all these drinks were sometimes strengthened by the addition of narcotics. The use of the dried disks of peyote for strengthening the distilled liquor called *mescal* has given to them the name "mescal buttons," and has led to the erroneous belief that these disks are obtained from the mescal plant, or perhaps that the mescal plant is a species of cactus. In inquiries relating both to maguey and to sotol, the plants so called are frequently characterized as cactuses. As a matter of fact, the magueys are species of Agave, belonging to the botanic family Amaryllidaceae, and the sotols are species of Dasylirion, belonging to the Lilliaceae. From both sources a sweet sap is obtained (the *nequatl*, or "honey-water," of the Aztecs), as harmless as sweet cider when fresh, but intoxicating like hard cider when fermented. This fermented sap, variously doctored with spices or perhaps with narcotics, is the well-known pulque of Mexico. The sap, in addition to sugar, contains albuminous substances, which after fermentation become ill smelling. These substances may be precipitated by the introduction of certain roots or barks containing tannin, after which the clarified liquor is decanted. The action of the tannic acid on the proteins in the pulque may be compared to that of hops in the manufacture of beer. In addition to precipitating the albuminous material, the barks or roots used for the purpose impart a pleasant aromatic flavor to the drink.[1]

The first to study the chemical properties of peyote was Dr. L. Lewin, who in 1888 used in his investigation dried plants furnished by Parke, Davis & Co. of Detroit. A chemical analysis was also made by Erwin E. Ewell.[2] who announced his results in a paper entitled "The Chemistry of the Cactaceae."

EFFECTS OF PEYOTE.

Various accounts of the effects of peyote have been published. In some of these the drug is said to produce beautiful color visions; in others, no such sensation is recorded. From the testimony of Indians, the effects seem to be of a hypnotic character. Peyote has been called a habit-forming drug, and some writers have likened it to hashish or Indian hemp. The latter, which has been introduced into Mexico and our Southwest under the name *marihuana*, is a most dangerous drug. Introduced clandestinely into prisons, it has been the cause of riots. Its use is now forbidden by the Mexican government. Peyote is never used habitually by the Indians, but is now used, as it was used four centuries ago in old Mexico, in certain ceremonials. It causes hallucinations, but its effect is quieting and there is no tendency to commit acts of violence by those who partake of it. More than this

[1] W. E. Safford, "The Use of Timbe Barks by the Mexicans in the Preparation of Alcoholic Drinks," *Science*, 29, 160, 1909.

[2] E. E. Ewell, "The Chemistry of the Cactaceae," *J. Am. Chem. Soc.*, 18, 624-643, 1896.

testimony was given by many of those who use it ceremonially in the so-called Peyote Church, that since joining the latter they have not only discontinued the use of all alcoholic stimulants but they do not even crave them. The greatest harm caused by peyote is its use as a medicinal remedy by the Indians, who regard it as a sacred plant possessing magic curative properties. By the unwise administration of it to little children and to invalids it has in all probability been harmful and even fatal.

Its physiologic and therapeutic properties were investigated by Drs. D. W. Prentiss and Francis P. Morgan[1] of the department of materia medica and therapeutics in Columbia University. Illustrations of the mushroom-like mescal buttons and of blooming specimens of both the typical form of *Lophophora williamsii*, with its tubercles in regularly radiating rows, and its variety *lewinii*, with the tubercles alternating or arranged diagonally, are included in an article[2] of mine published in 1915.

PHYTOCHEMICAL NOTES.*

No. 88. Oil of Catnip.

BY RALPH M. HIXON.[3]

Thanks to the kindness of Dr. E. R. Miller, there was available more than a liter of catnip oil which he had distilled during the seasons of 1915 and 1916 while he was chemist of the Wisconsin Pharmaceutical Experiment Station. A preliminary determination of the saponification value, which turned out very high, caused him to suspect the presence of a lactone. Hence, while working on lactones from plants in a general way, it seemed desirable to become further acquainted with the lactone possibly present in this oil. This naturally led to a study of the oil as such. It is with the general study of the oil that this report is concerned. The study of the lactone will be made the subject of a separate report.

The oils so kindly placed at our disposal by Professor Miller were several hundred cc of 1915 oil, about a liter of 1916 oil and approximately one hundred cc of cohobated oil of 1916. The physical and chemical constants so far as determined for these oils are herewith tabulated.

	1915 oil.	1916 oil.	
		Original.	Cohobated.
$d_{23°}$[4]	1.058	1.047	1.076
$\alpha_{D23°}$	.....	+5.59°	+2.55°
S. V.	.....	319	379
Soluble in 90 p. c. alcohol	miscible in all proportions[5]		
Soluble in 80 p. c. alcohol	....	1 : 1	1 : 1
Soluble in 70 p. c. alcohol	....	1 : 2.5[5]	1 : 2[5]

It becomes apparent that with the increase in density and of the saponification value, in other words, with the increase of the lactone content, the angel of rotation diminishes.

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[1] The results of their experiments were published in Volumes 19 and 20 of the *Therapeutic Gazette*, 1895 and 1896.

[2] W. E. Safford, "An Aztec Narcotic," *J. Heredity*, 6, July, 1915.

* From the Laboratory of Edward Kremers.

[3] Fritzsche Brothers Fellow.

[4] Schimmel & Co. report a density of 1.041, *Bericht* von S. & Co., Oct. 1891, p. 40.

[5] Upon dilution 1:9 the solution becomes opalescent.

W. Gildemeister describes the odor of the oil as not pleasant, minty and camphor-like.[1] The minty odor becomes much more prominent in alcoholic solution. The typical catnip odor resides in the non-lactone constituents, which constitute but a small fraction of the oil. This peculiar odor disappears in large part upon saponification of the non-lactone portion of the oil and is greatly intensified upon acetylation. Hence, it may be assumed that this peculiar catnip odor is due primarily to an acetic ester of an alcohol present only in small amount.

NON-LACTONE OIL.

In order to remove the lactone, the original oil was shaken with a ten percent aqueous sodium hydroxide solution using successive portions of alkali until the volume of the oil was no longer reduced. From 500 cc of 1916 oil a residue of but 65 cc was obtained. Upon steam distillation 29 cc of oil came over with the first 720 cc of water, indeed the bulk of the oil had passed over with about one-half of this amount of water. The next 660 cc of aqueous distillate carried over but 5 cc of oil and the last 820 cc of water only 2 cc of oil. Hence, of the 55 cc of non-lactone oil, only 36 cc were recovered by steam distillation with 2200 cc of water collected at the same time.

It thus becomes apparent that a large part of the non-lactone oil is anything but readily volatile with water vapor. In the distilling flask there remained a thick brownish oil. The odor of the second and third oil fractions, which reminded one of cadinene, together with the slow rate of steam distillation, would seem to indicate the presence of sesquiterpene.

This water-distilled oil was light straw-yellow in color with an odor like that of the original catnip oil. d_{23}° 0.900; $\alpha_{D22.5^{\circ}}$ -14.6°; $n_{D22.5^{\circ}}$ 1.4912; S. V. 24 (average) and S. V. after acetylation 84 (average).

Upon shaking the 2200 cc of aqueous distillate with heptane, recovering the bulk of the separated heptane by distillation, and filtering the residual hot heptane solution, there was obtained upon evaporation of the hydrocarbon an oily film which to one of us suggested mint (pulegone?), to the other tea. The former is readily understood; the latter suggestion, however, is of special significance in the light of the lactone hypothesis of the aroma of tea.

A second lot of 500 cc of oil treated with caustic soda solution for the removal of lactone was made up principally of 1916 oil, as before, also of 1915 oil and a small amount of 1916 cohobated oil. The non-lactone oil amounted to 68 cc. Upon distillation with steam about 28 cc were recovered. Fractionated over a direct flame this rectified non-lactone oil yielded the following results:

-175°	abt. 1 ccm.
175 to 205°	abt. 3 ccm.
205 to 235°	abt. 4 ccm.
235 to 245°	abt. 4 ccm.
245 to 255°	abt. 11 ccm.
Residue	

The viscid residue in the steam distillation flask was taken up with heptane and the residue from the fractionation added to this heptane solution and the solution distilled. After recovery of the heptane the mercury rose rapidly to 250° when signs of decomposition became apparent.

[1] "Die aeth. Oele," 2nd ed., Vol. III, p. 483.

The principal fraction, namely 245 to 255°, had a sesquiterpene odor; $d_{23}°$ 0.912, $\alpha_{D22.5°}$ −10.61°; $n_{D23°}$ 1.494; hence molecular refraction 65.08. According to density, therefore, it belongs to the dicyclic sesquiterpenes, according to molecular refraction between dicyclic and tricyclic. However, the amount of material was too small to insure anything more than a rough separation by fractionation.

A caryophyllene nitrosite test with 3 cc yielded a blue color, but no crystals. Other tests for sesquiterpenes, also Baeyer's test for pulegone, gave negative results. The fractions tested were so small and the material, after but one fractionation, too impure to afford satisfactory results. It becomes apparent that with the high lactone content it will require a large amount of material to separate the several non-lactone constituents in sufficient purity and quantity for identification.

THE MANUFACTURE OF SYNTHETIC MEDICINAL CHEMICALS IN AMERICA.*

BY ALFRED S. BURDICK, M.D.

Before the Great War, this country cut a small, indeed, an almost contemptible figure in the manufacture of synthetic chemicals of all kinds, and particularly in the production of synthetic medicinals. It is not the province of this paper to discuss the tremendous progress which has been made in the manufacture of dyes, although, as a matter of fact, dye production and the production of medicinals are so closely interwoven as to be almost inseparable for a clear understanding of the subject. Sufficient to say that in spite of the fact that the United States had almost illimitable sources to draw on for raw materials through its coal mines, coke ovens and gas plants, its manufacture of medicinal synthetics prior to 1914 was virtually limited to the salicylates, including salicylic acid and its salts, acetylsalicylic acid and salol. These substances were made in this country entirely by German-owned corporations.

A few other synthetics of closely allied character were being produced in small quantities, the principal ones being saccharin (the invention of an American chemist) and phenolphthalein, the manufacture of both of which was begun, I believe, by the Monsanto Chemical Company prior to 1914. Argyrol, which was also introduced by an American chemist, was being manufactured, but, strictly speaking, this can hardly be called a synthetic. I believe that these are the only medicinals, or near-medicinals, which we produced in any considerable quantity prior to this time.

If we consider this small beginning, and consider also the fact that our chemists were but inadequately trained to undertake the tremendous problem of manufacture of medicinal chemicals in this country, as compared with German chemists, whose work rested upon the secure foundation of many years of great achievement, all Americans have just reason to take pride and satisfaction in the accomplishments of the next few years.

Under the stress of necessity, and responding to the call of the government, a number of American manufacturers undertook the production of the most important synthetic medicinals. The number of those which might really be called indispensable was not as large as most of us may have been led to believe Per-

* Read before Chicago Branch A. Ph. A., January meeting, 1922.

haps there were a dozen all told, and of these all are now being made in the United States. Of course there are many other interesting and valuable synthetic remedies which are made in Germany at the present time and which are not as yet produced here, but for the most part these are remedies of minor importance for one reason or another—perhaps because they are used to replace other remedies of similar action and possibly equal merit, or because they have but a limited field of usefulness.

Of the really important remedies the manufacture of which in America was brought about by the war, probably the most important is arsphenamine (commonly known as salvarsan). Of the other synthetic medicinals made in this country, next in importance and of greater value from a commercial point of view is aspirin or acetylsalicylic acid. Other synthetics now produced in this country, in about the order of their importance commercially, are acetanilid, barbital (formerly known as veronal), barbital sodium and luminal—chemically closely allied—cinchophen (formerly known as atophan) and neocinchophen, procaine (formerly known as novocaine), anesthesin and orthoform, and sulphonol and trionol. All of these were originally German patented products, although the patents on some of them had expired prior to the war.

The problem which immediately presented itself was that of German patents. Our government was anxious that the most essential of these medicinals should be produced, but the American patents of such important things as salvarsan, veronal, luminal, atophan and novocaine were the property of enemy aliens. This difficulty was overcome by the passing of the Trading with the Enemy Act, which authorized the issuance by the Federal Trade Commission of licenses to manufacture these chemicals.

In order that the maker might receive reasonable protection for his investment, these licenses were made to run for the life of the patent, and the interest of the alien owner was protected by requiring the deposit with the Alien Property Custodian of a 5 percent royalty upon sales.

Following the passage of this law, a number of American houses were approached by representatives of the government with the suggestion that they undertake the manufacture of one or more of these products The Abbott Laboratories, which I have the honor to represent, was one of the manufacturing concerns which undertook this problem. We immediately began the necessary research work, and eventually manufactured three of these products under license—at first only for use in the Army and Navy. These three products were those then known as veronal, novocaine and atophan.

The Federal Trade Commission gave no exclusive licenses under the German patents. In every instance two, and in several instances three manufacturers were licensed to produce each product. It was not the policy of the Commission to give an unlimited number of licenses, because it was realized that the manufacturer going into this business was in a sense commandeered to undertake a patriotic duty; that before he could produce them large amounts of money would be expended in research; that it was exceedingly doubtful whether the undertaking would be a profitable one, at least for some of these chemicals; and finally that the close of the war, with uncertainty as to terms of peace, might bring all this effort and expense to naught.

Houses were selected by the government for the manufacture of these chemicals which already had some experience in synthetic work. From 1914 to 1917 The Abbott Laboratories had developed the manufacture of certain synthetic products. Soon after the opening of the Great War it began the manufacture of hydrochinone. The venture was not profitable, but it gave us experience. In 1916, following the renewal of interest in antiseptics brought about by the work of Carrel and Dakin in France, we had undertaken the manufacture of the chloramines, which have been favorably received by the medical profession. We had developed a fine chemical staff, and we thought we knew something about synthetic products. During the next two years we learned a lot, and it cost us a pretty penny; but when the war was over we had the satisfaction of knowing that we could make veronal, novocaine, atophan, chlorazene, dichloramine-T, anesthesin, and some other things, as well as, and of as good quality as any European manufacturing house.

It may interest you to know something about the present status of manufacture of synthetic medicinals by American houses. I will take up the most important and give you in a few words what I can which may be of interest to you.

Arsphenamine.—This is the substance formerly known as salvarsan. It was renamed "arsphenamine" by the United States Federal Trade Commission, upon the recommendation of the American Medical Association and the National Research Council. (I may say in passing that all of these German chemicals were given new names, particularly for the purpose of Americanizing these products to protect the American manufacturers, and for the purpose of fostering their continued production in this country after the war. These names were accepted by the Council on Pharmacy and Chemistry of the A. M. A. and will undoubtedly be made official in the next U. S. P.)

The first licenses for the manufacture of arsphenamine were issued to the Dermatological Research Laboratories of Philadelphia and to H. A. Metz & Co. of New York. The latter was the former American agent for the German manufacturer. The Dermatological Research Laboratories was the first to produce this difficult and important chemical in this country, and for some time before he was able to manufacture it himself supplied Metz with the product which he marketed. Not only did the Dermatological Research Laboratories produce arsphenamine of a quality equal to that manufactured in Germany, but it was able to cut the price to one-half and then considerably less, the result being a saving to American consumers of millions of dollars.

Before the war, at a congressional committee hearing in Washington the statement was made that more than a million doses of German salvarsan were being sold in this country. At the present time the consumption is probably considerably greater. There are said to be ten million cases of syphilis in the United States, so that the demand for this drug is enormous. There are now some five or six licensees, including the Takamine Laboratories, E. R. Squibb & Sons, the Mallinckrodt Chemical Works, and the Diarsenol Co., in addition to those already mentioned. Arsphenamine is being produced of a quality unexcelled in any country in the world. It is a difficult chemical to make, and on account of its toxicity it is important that it should be carefully supervised by a competent authority.

This is taken care of by the U. S. Public Health Service, under conditions which make it practically impossible for a chemical of inferior quality to be offered for sale.

Aspirin.—The patent on this product expired before the Great War, but the trade mark has been the subject of litigation for several years, and the case is still pending. It is manufactured by a number of American houses. The United States is now probably the largest manufacturer as well as the greatest consumer of this product in the world. According to the 1920 Census of Dyes and Coal Tar Chemicals, 1,708,436 pounds of aspirin were produced here in 1919. It is probable that the present output is in the neighborhood of two million pounds a year. This is the equivalent of 2,800,000,000 5-grain tablets, and at retail must bring at least $25,000,000.

Acetanilid.—I mention this drug mainly on account of the large quantity which is being manufactured and used. According to the Dye and Coal Tar Census, 1,255,140 pounds were made in this country in 1919. Doubtless a large share of this goes into proprietary headache powders and tablets.

Barbital (Introduced as Veronal).—Authentic figures concerning the volume produced in this country are not available. Judging from our own experience with the product, and only guessing at the amount produced by other manufacturers, I should say the total American production is more than 10,000 pounds a year. Licenses were issued for its manufacture to Antoine Chiris & Co., the Rector Chemical Company and the Abbott Laboratories. As far as I know, the Rector Chemical Company has never produced it in appreciable quantities.

Upon the sale of the assets of the German house of Bayer to the Sterling Products Company, the barbital patent was acquired by this American firm; manufacture was undertaken by the American house of Bayer, its assignee, and the product is now being sold under license from that corporation by the Winthrop Chemical Company of New York. At the present time there are three manufacturers only—Bayer (Winthrop), Chiris and Abbott.

American-made barbital (veronal) is now selling in this country at about half the price asked by German manufacturers in America before the war. In spite of this, Europeans are clamoring for the admission of their product and have offered it for sale in this country at prices only slightly more than the cost of intermediates and raw materials. Considerable quantities have been smuggled into the United States. If American manufacturers are given adequate protection during the critical period of the next few years they will be able to meet any reasonable competition.

Barbital-Sodium, the action of which is virtually identical with that of barbital, is manufactured by The Abbott Laboratories, but the sales are small as compared with barbital.

Cinchophen.—Licenses for the manufacture of cinchophen were issued by the Federal Trade Commission to a number of houses, but at the present time only three or perhaps four concerns are producing it in the United States. Until very recently The Abbott Laboratories manufactured it under license from the Federal Trade Commission. At present all producers are manufacturing under license from The Chemical Foundation. Besides our own firm, it is manufactured by the Calco Chemical Company, and by Schering & Glatz, the last firm controlling the trade-marked name citophen.

Cinchophen, and to a less degree neocinchophen (also made by the Calco Company under trade name Tolysin) has been one of the surprises in chemical manufacture. Before the war atophan was used for the treatment of gout, and for this purpose only. During the last two years particularly, the demand for it has greatly increased—probably because it has been shown to be efficient in the treatment of acute rheumatism and rheumatic conditions generally. Papers by such men as Hanzlik, Chace, Meyer and others have shown it to be less irritant to the stomach and less harmful to the kidneys than the salicylates, while it is equally efficient, if not more efficient, for the relief of pain and as an eliminant. I have reason to believe that many physicians are prescribing it instead of aspirin. Probably 30,000 pounds of cinchophen are being made annually in this country. It is being produced in this country at least as cheaply as in England. German costs of production I am not familiar with. Cinchophen will undoubtedly be the official name of this substance, which was formerly known as atophan.

Procaine.—This substance was introduced from Germany under the name Novocaine. It is very widely used as a local anesthetic. Probably seventy-five percent of that sold is used by dentists for the extraction of teeth and for other dental operations. When we began the manufacture of this product, I had the belief—which I presume is shared by most of you—that a very large amount was employed by physicians. Strangely enough, only relatively little of it is used by the medical profession—a fact which is greatly to be regretted because it is a substance which can be employed easily, safely and profitably in thousands of cases in which operation is performed at the present time under ether or chloroform, or, worse yet, with no anesthetic at all. Such men as Crile of Cleveland and Harris of Chicago are warm advocates of its use in the method of anesthesia called variously "anociassociation" or "nerve blocking."

Procaine is a very expensive drug to produce, but the price is going steadily downward; it is sold, in quantity, at the present time much more cheaply than it was ever sold by the Germans before the war. Licenses were issued for its manufacture to H. A. Metz & Company, the Rector Chemical Company and The Abbott Laboratories. The present status of its production by the Rector Chemical Co. I am unable to give you, because of certain changes in organization which have taken place in that house. The largest producer is Metz. The quantity sold can only be estimated, but I believe it cannot exceed 3000 pounds a year.

Luminal is manufactured only by the Winthrop Chemical Company, which operates under the patent owned by Bayer.

Anesthesin is manufactured by The Abbott Laboratories and by H. A. Metz & Co. Its use is increasing. This drug is an effective anesthetic in powder form, and, being insoluble, is of only very low toxicity and therefore can be used safely orally and as a local application. Large quantities are being manufactured into troches and lozenges for the treatment of cough and relief of pharyngeal irritation. It is also being employed in increasingly large quantities in various dusting powders. Anesthesin is a side product in the manufacture of procaine.

Of the other items mentioned I can give so little information concerning manufacture, prices and quantities produced that I shall omit further reference to them.

New Products.—Few physicians or pharmacists realize how much research work has been done in this country by manufacturers of pharmaceutical chemicals during and following the war nor can they understand how great the promise is in this field, providing reasonable protection is given to this industry during the next decade. For instance, "research laboratories are expensive to maintain. It is only through these laboratories that new substances may be discovered which will make America independent of foreign sources of supply." Permit me to call attention to a few of the things which have been accomplished by American firms during the last few years.

During the war, Browning and others in England showed that certain dyes, particularly the flavines and brilliant green, had peculiar value as antiseptics. Of these the flavines (acriflavine and proflavine) are the most valuable. The manufacture of these was not undertaken in the United States until after the close of the war. These are now produced by the Heyl Laboratories, the Van Dyk Company and The Abbott Laboratories. The synthesis of the flavines is exceedingly difficult, involving many steps and great expense in the production on an industrial scale. In spite of its high price acriflavine is being used in increasingly large quantities, particularly in the treatment of gonorrhea for which it has certain well-marked advantages. Recently E. G. Davis, of the University of Nebraska and Johns Hopkins University, has shown that acriflavine, taken internally, is an effective urinary antiseptic. He tested it experimentally in comparison with some 400 other remedies, and found it the best of all those which he tried. It is also being used in a very limited way intravenously for the treatment of various septicemias.

A product somewhat similar in action, and likewise a dye, which has been developed in this country mainly since the war, is mercurochrome, manufactured and sold by Hynson, Westcott & Dunning, of Baltimore. It is also used mainly in the treatment of gonorrhea.

In the field of local anesthetics, Parke, Davis & Co. have produced apothesin, which chemically is the g-diethyl propyl alcohol ester of cinnamic acid. It is giving good satisfaction and is already being widely used.

A substance which has been developed as a local anesthetic is saligenin, which has been brought to the attention of manufacturing chemists and the medical profession by Prof. A. D. Hirschfelder of the University of Minnesota. Chemically it is salicyl alcohol. It is being manufactured by the Calco Chemical Company and by The Abbott Laboratories.

Benzyl alcohol has likewise been suggested as a local anesthetic, and is being used to a limited degree. This is the work of Prof. David I. Macht of Johns Hopkins University.

The Abbott Laboratories has introduced a new local anesthetic under the name butyn. Chemically this is the sulphate of p-aminobenzoyl gamma-di-n-butylamino propanol. So far as we know, this is the first local anesthetic introduced primarily to replace cocaine. It has the advantage of being at least twice as anesthetic as the latter substance, being more rapid in action, giving more prolonged anesthesia, causing no irritation, being stable on boiling, and being slightly antiseptic, and non-narcotic. It is the invention of Professors Roger Adams and Oliver Kamm of the University of Illinois and Dr. E. H. Volwiler of the Abbott Laboratories. The product will be referred to again.

A notable discovery, not distinctly in the synthetic field but yet in a line closely allied to it, was that of thyroxin, the active principle of the thyroid gland. This was made by Dr. E. R. Kendall, of the Mayo Foundation. The prediction is made that this will eventually be made synthetically. This substance is probably much more valuable than anything heretofore known for increasing metabolism in diseases caused by hypothyroidism. It has recently been placed on the market by E. R. Squibb & Co.

A very interesting discovery, made by Dr. David I. Macht of Johns Hopkins University, was that benzylbenzoate, a substance heretofore known principally to perfumers, was in reality a powerful antispasmodic. Benzylbenzoate has opened a new field; although it has at times been disappointing in practice, its study has led us into some very interesting research work, to which I will refer later.

The Difficulties of Original Research.—Few realize the difficulties involved in putting out a new or even an old synthetic chemical. When the work in the chemist's laboratory is finished, or seems to be finished, the trouble has only begun, because the production of chemicals on an industrial scale involves the handling of larger quantities, under varying conditions as regards temperature, pressure, etc., and the question of yield immediately becomes vital, for if a sufficient yield is not produced not only from the final step, but at every step in the course of production of one of these finer chemicals, its manufacture in a commercial way becomes impossible.

In elaborating a new product, the work of the chemist has to be done over and over again. You all remember the classic experience of Ehrlich, who was only able to produce salvarsan after 695 ineffectual attempts.

I have referred to butyn, the new local anesthetic which The Abbott Laboratories is just now placing on the market. Before we were able to produce this substance we made about forty new chemical bodies. Most of these were carefully tested upon animals. A number of them had merit as local anesthetics, but until butyn was reached none was found which presented decided advantages over anesthetics already available.

I may say in passing that before the war butyn would have been impossible of manufacture, because butyl alcohol, one of the most important intermediates in its production, was practically unknown and procurable only at a prohibitive price. It was a curiosity. Its commercial manufacture grew out of the synthetic production of acetone, which was required as a solvent for the making of explosives.

In the production of a new chemical like butyn the closest collaboration between the chemical laboratory, the pharmacological laboratory, the physician, and the industrial producer is essential, in order to get satisfactory results in a reasonable time. No synthetic product heretofore produced in this country has been the result of such favorable collaboration between these different agencies. The chemical work on it was done in part in the laboratories of the University of Illinois and in part in our own laboratories. The pharmacologic work was undertaken primarily by our Mr. Nielsen, and then was taken over and carried through exhaustively by a pharmacologist in one of our leading universities. The clinical work was done in part in private practice by Dr. Harry S. Gradle of this city and by about 100 other physicians and dentists, and in part by the Research Committee

of the Section of Ophthalmology of the A. M. A., under the direction of Dr. Albert E. Bulson, Jr., of Fort Wayne, Indiana. We base our claims for this product upon the collective work of these various groups.

In this connection I wish to refer briefly to a new product which stands in the same relation to butyn as anesthesin does to procaine. I mean butyl *p*-amino benzoate, which for convenience we are calling butesin. This local anesthetic was invented by one of our chemists some two or three years ago. The preliminary tests showing that it had merit, it was submitted to Dr. A. S. Loevenhart of the University of Wisconsin for pharmacologic research. His report showed that it was more powerful than anesthesin, and its action about six times as prolonged. It is insoluble in water, and according to preliminary investigations practically non-toxic. As a matter of protection it was patented, but in view of other extensive and more promising research, no effort was made to have it tested out clinically. About three months ago we were notified that our patent would be contested by the Societé des Usines du Rhone, the largest manufacturing chemical house in France. This concern has already patented this chemical in France, Germany, Switzerland, Italy and Great Britain. Fortunately we have been able (we believe) to prove priority in the United States. This illustrates how easily our expenditures for research may be nullified.

An exceedingly interesting research has been carried on in our laboratories on the benzyl esters, in an effort to find an antispasmodic superior to benzyl benzoate. We have made a large number of these esters, the most important being benzyl succinate, benzyl stearate, benzyl phenolate, benzyl cinnamate, benzyl fumerate, benzyl salicylate, and benzyl acetylsalicylate. In addition to their manufacture, a series of hydrolysis tests was carried out with these esters, to ascertain if possible whether the rate of hydrolysis had any relation to the physiologic action of the drug. All of these esters were then exhaustively tested pharmacologically upon cats and dogs, the method employed being one devised in our own pharmacologic laboratories. The results of this research were published in *The Journal of the American Chemical Society* and in the *Journal of Laboratory and Clinical Medicine*. They seem to show that of these esters two, *i. e.*, the fumerate and the acetylsalicylate, possess outstanding merit. Before committing ourselves, it will be necessary that the drugs be tested clinically. Only a limited amount of such work has been done with these preparations as yet. In the meantime, other new benzyl esters heretofore unstudied are being made. We hope that as the result of this work something of value may be evolved.

Expense of Research.—Few people realize how expensive it is to "discover" and put on the market a new synthetic chemical. At the present time, in the United States, the manufacturer who wishes to go into this field must take a gambler's chance. The Abbott Laboratories has been willing to take this chance because it believed that the future of any pharmaceutical firm depends upon its ability to measure up to the spirit of the times and bring its business into accord with the changing and developing tendencies of the age. Thus far we have been satisfied with the result, but we are free to confess that we cannot plumb the future. Our own experience has been that to develop a purely synthetic medicinal chemical, involving what we may call an average degree of difficulty for one of the finer preparations of this class, means a cash outlay of from $25,000 to $50,000. I

mean that every dollar of this amount will be put into the product before a dollar comes back. This expenditure is for research only; but by "research" I mean not only the money spent by the chemist and pharmacologist but also the outlay involved in turning out the product on an industrial scale. Before we learned wisdom by experience, we have seen some thousands of dollars go down the sewer when a reaction went wrong.

The question will arise in your mind whether expenditures like this, and risks like these, for indeed they are risks, are really worth while. We believe they are, because, as we have already said, the future of this country in the medical field, as well as in industry, is going to depend very largely upon the collaboration between the chemist and the other fellow, and in this case the other fellow is the physician, the pharmacist, and the clinic. In thinking about this collaboration, it is important that we should consider how we can utilize all our latent forces. Germany acquired prominence in the medical field because the German government was quick to realize the importance of the chemical industry in both peace and war. There was brought about a closely interwoven and mutually profitable relationship between the universities, the therapeutic research organizations, hospitals and clinics, and the manufacturing houses. Say what you will about the Germans, they did not cut each other's throats, and they did not encourage foreigners to come in and scuttle the ship. Their protection was skilful, but absolute. It was external as well as internal. They not only made the goods, but they went out and got the markets.

I do not advocate the adoption of the German method in this country, but I know that as far as research is concerned it is vitally important that our universities, which are now as finely equipped and turning out as good men as other similar institutions in the world, should receive the best kind of encouragement—the assurance that their graduates will get jobs when they are through, and this can only be accomplished by the protection of the manufacturers who are undertaking to risk their money in a business which, to say the least, is a precarious one. Research in the universities and such scientific institutions as Rockefeller, Sprague, McCormick, Mayo, Brady and other institutes must be linked with research in the manufacturing houses themselves. Further, even the richest of our great research institutions are handicapped by lack of endowment. The manufacturer will not hesitate to spend $50,000 or more a year in research if there is a reasonable prospect that he will get a run for his money; but $50,000 a year is the interest on an endowment of a million dollars—and how many universities or other purely research organizations can afford to set aside a million dollars simply for the study of a single drug, which may or may not be valuable when the work is done?

As an illustration of what is being done by the greatest of our research institutions, The Rockefeller Institute, let me quote from a pamphlet entitled "The Future Independence and Progress of American Medicine in the Age of Chemistry," written by Abel, Alsberg, Bacon, Eldred, Hunt, Johnson, Stieglitz, Taylor and Herty, and published by the Chemical Foundation:

"The largest and most prominent of these institutions," this pamphlet states, "is the Rockefeller Institute for Medical Research. The staff of this institute consists of ten 'members' with their associates and assistants. Eight of these 'members' are occupied with studies on bacteriology, pathology, immunology, serology,

general physiology, diseases of animals, experimental surgery, clinical researches on diabetes, heart disease, kidney disease, pneumonia, yellow fever, meningitis, infantile paralysis, etc. In the fall of 1920 announcement was made that during the ensuing year the following diseases would be made the subject of special study at the institute: acute lobar pneumonia and other acute pulmonary infections, measles, acute rheumatic fever, cardiac disease and nephritis.

"Two 'members' devote their time to chemical work. The activities of the one relate largely to the structural chemistry of nucleic acids, lipoids, and other important components of the body. Under this 'member,' also, are chemists whose work relates to chemotherapy; their researches have extended to such compounds as derivatives of hexamethylenetetramine, of certain arsenic acids and of quinine. A number of these derivatives have been tested in other divisions of the institute and in the hospital, for their therapeutic action. The other chemical 'member' works in connection with the hospital of the institute and his work at present relates chiefly to refinements in the methods of blood analysis and other methods of clinical interest. A third 'member' of the institute is working on the fundamental theory of colloids and the application of other physical relations of life phenomena. Part of the excellent work of this institute is in the direction of our chief aims, but the emphasis is rather placed on the pathological and other medical features of the problems than on the direct attack on the problems of medicine by means of a concerted, wholly coöperative effort of leaders in the fundamental sciences of chemistry and physics, in pharmacology and in medicine."

This quotation shows not only that the Rockefeller Institute is doing magnificent work, but that even the fine endowment available is only sufficient to scratch the surface from the chemical point of view. Compare the methods employed in this country to develop chemical knowledge in medicine with those prevailing in Germany. We find that in the latter country there is the most complete possible collaboration covering the whole scale and ending only with the manufacturer, who works hand in hand with the research institute, the clinic, and, most important of all, the government.

In our establishment we are seeking contact with the best scientific minds of the country. We try to get acquainted with and keep in touch with the work of the brilliant research men who prefer to teach, and should be encouraged to teach. We believe that here is a great mine which can be developed not only for our profit, but to the benefit of the entire country.

Following this contact on one side with the chemists, we are anxious to develop the other side, closer contact with the clinical resources of the country, because progress in medicine commensurate with the greatness of this country is only possible by coöperative utilization of our undeveloped resources in brains. The achievements of the last few years, of which we are all justly proud, are due largely to the fact that we were forced to cut loose from the apron strings of German science. We found we could walk alone, and some of us now think we might grow up; but there are people in the United States who still believe that only the Germans know how to make dyes and drugs, and that we should return humbly to our former condition of scientific dependence. Such a surrender then—for surrender it will be—means setting back the hands of the clock so far as the progress of American medicine goes. It means that we shall be unable to contribute our proper

share to the scientific work of the world during the next generation. It means that medicine will not develop in this country as it will elsewhere in the world, where chemical sciences are recognized as being fundamental to a knowledge of the human body in health and disease and to the maintenance of the public welfare.

I appeal to you gentlemen, whose interests are closely allied with those of the chemical manufacturer, for support at this critical time which means so much to the future of this, our common country.

VITAMINES, AN INDISPENSABLE NUTRITIVE GROUP.*

BY M. F. WILSON, M.D.

The subject of the vitamines is of particular interest to the pharmaceutical profession, due to the fact that it presents not only the most recent advance along pharmaceutical lines of the last few years, but also due to the fact that the vitamines are the most frequently discussed subject in medical literature, as well as among the lay magazines and the daily press. Over 110 papers have appeared in the last three years in medical literature upon this subject, and in our newspapers, under public health columns, the subject is mentioned almost daily. Only a short time ago, a celebrated writer suggested the possibility that in the near future we would have a shaker containing extract of the vitamines alongside of our salt and pepper cellars, in order that we might apply the extract to our food rations to make up for the deficiency.

It is only in later years that this substance has been studied with any degree of accuracy, but clinicians and pathologists have long known that there were certain diseased conditions arising in the course of their studies which could not be traced to any then known etiology. Most of these conditions can now be classed under the heading of "Vitamine Deficiency" diseases. Jack London, in his story of "The Tale of the North," recites an incident where the early pioneers in the Alaskan region were affected during the winter months with scurvy in which they found that the eating of raw potatoes was curative. He states that when this fact became generally known this article of diet increased in price to such an extent that it became a bankable commodity. In the light of the present knowledge we know that potatoes simply supplied the lack of vitamines and brought about a cure in this way.

During the last war in certain regions of the old world, particularly in Denmark, children who were fed upon the so-called centrifugalized milk and "export" cream developed a variety of peculiar but characteristic symptoms, but upon the feeding of these infants with whole milk and cod-liver oil containing vitamines, they rapidly improved and soon became normal.

The beginning of the scientific study which ultimately resulted in the isolation of the extract of the vitamines dated from the Japanese-Russian war. Sailors of the Japanese navy were attacked with a malady called beri-beri or polyneuritis. Hundreds of these men were affected, suffered agonies and resulted in the death of many. The disease was characterized by soreness in certain sets of the muscles, gastric disturbances, loss of power in the muscles of the legs, heart ir-

* A brief extract from an illustrated lecture delivered before Section on Practical Pharmacy and Dispensing, A. Ph. A., New Orleans meeting, 1921.

regularities, "dropsy" which was frequently followed by paralysis and death. The medical officers of the Japanese Navy investigated the cause of the malady and decided that it was the same disease described by a Russian physician previous to the war, in which a diet of unpolished rice had proved curative. The Japanese physicians adopted this diet and, much to their gratification, found that those who were suffering from the disease, and had not advanced too far, soon became normal and the disease did not again make its appearance as long as an unpolished rice diet was adopted.

From this medical episode a number of investigators began the study of this subject, among the most prominent being Funk, McCarrison, Emett, Allen Cooper, Drummond and others. These investigators soon learned that in order for food to be effective, it must contain the vitamines in proper proportions, in order that a life process may go on normally.

To date, three classes of vitamines have been discovered, namely: fat soluble A, water-soluble B, and water-soluble C. The fact is well established that each of these three types bears a specific rôle in nutrition, and that all three must be present in the body to produce the optimum results. A recent editorial in *The Nation's Health* states that "It is more than probable that many of the more obscure disorders and all sorts of common languors, inefficiencies, and susceptibilities, and many miscellaneous infections are classed with a shortage of vitamines." It has been proved beyond doubt that the vitamines are essential to growth, development, reproduction, and maintenance of the normal physiological state in practically all forms of animal life, from the highest to the lowest.

Experiments on rats and other animals show that an absence of the fat-soluble A vitamine will produce in a short time a marked loss of weight, disordered nutrition of the skin, and a peculiar condition of the eye, called xerophthalmia. This condition of the eye is peculiarly interesting and experiments have been conducted to prove that it can only be caused by a diet in which the fat-soluble A vitamine is lacking. The disease is characterized by a conjunctivitis with atrophy of the cornea without liquid secretion. If allowed to continue, the disease will result in total blindness.

Clinical experiments have also proved that conditions similar in type may also be brought about in children who are fed upon overheated and centrifugalized food. The effect of the absence of water-soluble B vitamine in animals seems to be directed towards the nervous system, with the maximum effect upon the spinal cord. In pigeons and rats this is shown by a peculiar paralysis of the limbs. The animal loses the use of the limbs altogether. If this condition is allowed to continue the result will be convulsions, and ultimately death.

Water-soluble C vitamine deficiency diet will bring about in animals scurvy characterized by soreness of the gums, bleeding which will go on to ulceration, pus will exude, and the teeth will become loose in their pockets, absorption of the alveoli may take place in some instances, suggesting in every respect symptoms ordinarily observed in pyorrhea alveolaris, in human beings.

The absence of the vitamines has a peculiar effect upon the gastrointestinal tract, and, according to McCarrison, dilatation of the stomach, indigestion, deficient action of the liver and pancreas, air-locks in the small intestines, and even colitis may be produced by a low vitamine deficiency diet.

Now as to the practical application of the study that has thus far been done on the vitamines, the following facts are important: We know that foods are affected as to the vitamine contents by the modern process of canning, by boiling or heating to the boiling point, for a certain length of time, absolutely destroying the water-soluble B if the heat is maintained for two or more hours. Fat-soluble A is injured at least in part, and water-soluble C is destroyed in a very short time.

Vegetables placed in cold storage for a great length of time injure the vitamines and dried vegetables for preservation are often injured by the process. Moreover, we know that some persons live on a one-sided diet, and that ofttimes it is difficult, in children especially, to have them eat the proper assortment of food. Eddy and others have found that even though the diet of a child contain an appreciable amount of vitamine B, there was a marked stimulation of growth when three percent of the extract of vitamines was added to the food. He explained this on a basis that an extracted vitamine is more readily available than that contained in the food.

It is thought by some authorities that the vitamines act as catalyzers, and that their mere presence enables the system to absorb and assimilate the food products. Therapeutically the vitamines are indicated in the treatment of malnutrition, and disordered metabolism in such vitamine deficiency diseases as rickets, beri-beri, pellagra and scurvy, in the convalescence from acute infectious diseases, in certain intestinal disorders and as an adjunct treatment in ill-defined disorders of nutrition, anemia and other dyscrasias.

ABSTRACT OF DISCUSSION.

Chairman H. M. Faser thanked Dr. Wilson for his address and asked him whether he would answer questions proposed by members. Replying that he would—

F. W. Nitardy inquired whether a well-balanced diet would not supply the vitamines. Dr. Wilson replied that it would, but children at the same table would differ in their preferences for food; certain individuals cannot assimilate foods containing the necessary vitamines. Experiments bearing on the question were shown.

REVISING THE NATIONAL FORMULARY.*

BY P. HENRY UTECH.

Much of that which transpired and was transacted at the City of Pittsburgh meeting of the American Pharmaceutical Association thirty-five years ago has been forgotten, or is part of the records of the Association. The outstanding feature of that Convention, which has proven to be epoch-making in character, was the appointment of the committee which later, in 1888, brought about the publication of the first edition of the National Formulary. It is, therefore, particularly fitting that you, as representative pharmacists, encourage the fine spirit of these pioneer pharmacists, and do your part in carrying on this good work, the publication of which stands out as a waymark in the onward march of pharmacy.

The revisions of the National Formulary reflect the progressive spirit of our calling. The statement is frequently heard, that pharmacy as a profession is retrograding, is fast losing its prestige; that the inroads of commercialism are demoralizing all that is fine, honorable and ethical in our calling. Statements of this character, with only slight modifications, would, perhaps, apply with equal

* Parts of an address before Pittsburgh Branch, A. Ph. A., November meeting, 1921.

force to conditions existing decades ago. The sooner we come to the realization that the business of pharmacy, the profession of pharmacy, and the trade of pharmacy have a common interest and purpose, and that all can go along together hand in hand with noble principles and high ideals, the sooner we will be on the high road of progress and establish our position and prestige as pharmacists in the community in which we live and serve. Indeed, no further testimonial to the progressive spirit dominating pharmacy to-day can be had than the large number of men of ability chosen from the rank and file of our calling—men in sufficient numbers to cover the entire field of pharmaceutical research and endeavor—who are actively and whole-heartedly engaged in this work of revision with no thought of remuneration or reward, other than that which comes of being of service to their fellow-men.

Since the last revision of the National Formulary, many States have enacted legislation inimical to the best interests of pharmacists. Your Committee, taking cognizance of this, is investigating the economic and commercial conditions affecting pharmacy, to the end that the new Formulary may be of greater practical value and at the same time consistent with the best methods of pharmaceutic practice.

Notwithstanding the National Formulary has fully justified its right to existence, the necessity for such an authoritative book of standards for preparations in common use was urgent, and yet the first three editions of the Formulary, covering a period of almost two decades, met with only partial success; but with the passage of the Federal Food and Drugs Act in June 1906, when governmental sanction was given the Formulary and it became a duly recognized book of standards, renewed interest and activity were immediately manifested in the work by pharmacists everywhere. As an index of the present popularity of the National Formulary, it might interest you to know that the sale of the present edition has reached almost 35,000 copies.

As before stated, three editions of the book appeared before it was given legal standing, and it is to the credit of its authors that although the last of these was published only a few months prior to its official adoption by the United States Government, only a few slight changes were required to make the book an acknowledged legal standard. It is interesting to know also that since the recent enactment of the Eighteenth Amendment, the National Formulary is likewise the official book of the National Prohibition Law.

The third revision of the National Formulary, completed in 1916, contained no radical changes; a chapter on Sterilization was added. The Committee felt justified in undertaking a revision at this time—just five years later—so as to keep pace with the revision of the United States Pharmacopoeia, the aim being to have the two volumes appear simultaneously, if possible.

The present Committee of fifteen members was appointed in 1919. They have held two sessions, the entire committee being present at both sessions. This Committee is divided into twelve sub-committees and the entire work has been assigned to them for the purpose of investigation and review. At this date the work is progressing rapidly and about half of the revision work is already completed.

Thus far of the 589 formulas of the present edition of the National Formulary 101 have been deleted, and other preparations have been placed on the proposed list of deletions. The titles of these have been published in the Pharmaceutical

Press in order that pharmacists throughout the United States may be given opportunity to register their opinions concerning them. The Committee endeavors to secure the widest possible publicity in this part of the work to the end that pharmacists in all sections of the country may be given an opportunity to express themselves and thereby prevent, as far as possible, unfavorable comment on the completed work.

DELETIONS, CHANGES AND IMPROVEMENTS.

The most radical step taken by the Committee in revising the National Formulary is the deletion of the entire list of medicated wines as a class; three of the more important wines, *viz.*, Antimony, Colchicum Corm and Ipecac are to be replaced by corresponding tinctures; Wine of Beef and Iron will be represented by an elixir.

A Table of U. S. P. and N. F. substances and of the official preparations in which they are contained as active ingredients, will be included. A dose table will be printed in Part III, apart from the preparations and drugs. Assay processes will be given for many of the potent drugs and preparations. The alcoholic content by volume will be stated wherever same is practicable; for each preparation a variable range of alcoholic strength will be given. The volume of alcohol necessary for each preparation is being studied, with a view of using the minimum amount required for permanency, preservation or therapeutic activity of the preparations containing alcohol.

A standard of 12 grains per fluidounce with an acidity of 0.05% HCl or its equivalent of other acids, based on H ion concentration, will be provided for pepsin preparations.

Monographs for liquid preparations of chemicals wherever practicable will be included, giving description of physical properties, identification tests, assays, etc.

Ampuls will be officially recognized and special directions given for proper cleaning and sterilization. The chapter on tablet-making will be limited to their extemporaneous preparation. Troches of Gambir and of Peppermint are in the list of deletions, and the following are to be included as tablets: Charcoal, Phenolphthalein, Quinine Tannate, Santonin, Santonin Compound, Sulphur and Cream Tartar.

Additions or important changes in formulas are to be indicated in the text by some distinctive sign. Preparations employed in veterinary practice and preparations used in dental practice are to be included.

THE NEW ITALIAN PHARMACOPOEIA.*

The Italian pharmacy law of 1913 stipulates that every five years the Minister of the Interior shall cause the official Pharmacopoeia to be revised and a new edition published. The third edition of the Italian Pharmacopoeia was issued in 1909, and in 1914 a commission was appointed for its revision, consisting of Professors E. Paterno, V. Cervello, L. Pesci, and C. Manuelli, three of whom had already figured as the compilers of this work. Later, during the same year, the Commission was strengthened by the appointment of two pharmacists—an innovation—the gentlemen selected being Sig. T. Bosio, President of the Association of Pharmacists of the Province of Turin, and Sig. A. Quercia, President of the Association of Pharmacists of the Province of Bari.

* A review reprinted from *The Chemist and Druggist*, December 31, 1921, pp. 57–60.

Externally, the new edition is a thicker volume than its predecessor, although the number of pages has been increased only from 452 to 524, but it is printed on thicker paper. The size has remained the same—$8^1/_2$ in. by $6^1/_4$ in.

ADDITIONS AND OMISSIONS.

In the new edition twenty-eight articles figuring in that of 1909 have been omitted, *viz.:*

Hydrocyanic acid.
Plain aërated water (CO_2).
Bromine.
Iodoform bougies.
Centaury.
Corrosive sublimate cotton wool.
Decoction of guaiacum wood.
Decoction of pomegranate.
Decoction of taraxacum.
Oil of cajuput.
Extract of centaury.
Extract of juniper.
Extract of guaiacum.
Extract of pomegranate.
Extract of savin.
Extract of taraxacum.
Corrosive sublimate gauze.
Infusion of elder flowers.
Lead iodide.
Solution of mercuric nitrate.
Cod-liver oil with ferrous iodide.
Syrup of anise.
Ammonio-sulphate of copper.
Mercury succinimide.
Taraxacum.
Tincture of saffron.
Antimonial wine.
Saffron.

On the other hand, sixty-three new articles and preparations have been added, and it is interesting to note that of this total no fewer than thirty-three of the additions made take the form of galenical preparations, several of which represent well-known proprietary products, while only seven modern synthetic compounds have been added to the new edition. These additions are as follows (the trademark designation, as it appears in the index, being given in parenthesis):

Silver proteinate (protargol).
Silver in leaves.
Cantharidin.
Kaolin.
Saccharated iron carbonate.
Crude potassium carbonate.
Naphtholated charcoal.
Cardamom seeds.
Caoutchouc.
Keratin.
Para-aminobenzoyl-diethylamino-ethanol hydrochloride (novocain).
Calcium chloride.
Cantharides collodion.
Condurango bark.
Confection of prunes.
Crude cresol.
Solution of cresol with soap.
Decoction of condurango.
Decoction of barley.
Caoutchouc plaster.
Liquid extract of cinchona.
Liquid extract of condurango.
Phenolphthalein.
Silver fluorosilicate.
Gelatin.
Sodium hyposulphite.
Hydrous lanolin.
Mucilages.
Sodium nitrite.
Cod-liver oil with iodine.
Pastes.
Bismuth and magnesia pastilles.
Arsenious anhydride and ferrous lactate pills.
Creosote pills.
Phenolphthalein pills.
Podophyllin and cascara sagrada pills.
Pulp of prunes.
Acetyl-para-amidophenyl salicylate (salophen).
Mercuric salicylate.
Dimethyl-dimethylamido-isopyrazolon salicylate (pyramidon salicylate).
Scammony.
Cinchona and iron syrup.
Syrup of calcium and sodium glycerophosphate.
Compound syrup of hypophosphites.
Syrup of calcium lactophosphate.
Compound syrup of potassium guaiacolsulphonate.
Iodotannic syrup.
Aluminium sulphate.
Dehydrated calcium sulphate.

Potassium guaiacolsulphonate (thiocol).
Guttapercha.
Infusion of marshmallow.
Infusion of chamomile.
Infusion of mallow.
Infusion of salep.
Infusion of senna.
Albumin tannate (tannalbin).
Tincture of adonis.
Compound tincture of jalap.
Tincture of henbane.
Benzoated tincture of opium.
Traumaticin.
Tribromophenolate of bismuth (xeroform).

STANDARDIZING DROPS.

Among the notes which precede the text of the Pharmacopoeia the following are of interest:

Heroic drugs have to be powdered in their entirety, without leaving any portion. All drops have to be measured by means of the normal dropper decided upon at the Brussels Conference (compare B. P., page xi). This provision, which has been adopted in all recent Pharmacopoeias, is important, since it must be borne in mind that Continental pharmacy does not possess a unit corresponding to the British minim, and it is not customary to prescribe liquids to be taken in fractions of a cubic centimeter. The great difference which exists between an ordinary drop, or even a minim, and the normal drop—a difference which is fraught with serious consequences in the case of solutions of powerful drugs—is best illustrated by taking a practical example. One cubic centimeter approximates 17 minims, but while 1 cc of distilled water is equivalent to 20 normal drops, 1 cc of tincture of strophanthus represents no less than 50 normal drops, a point which must be borne in mind when dispensing foreign prescriptions, for in this instance, to dispense on a prescription including "tinct. strophanth. gtt. L." 50 minims of tincture would be giving three times the amount actually intended by the prescriber. The whole question of drops has, in fact, been rendered still more confused by the introduction of the normal dropper, at least until it is universally adopted by all prescribers, since the difference between what is commonly understood as a "drop" and the "normal drop" is very great in a large number of instances, and may give rise to serious divergences.

RULES FOR STERILIZATION.

In the preface to the new Italian Pharmacopoeia precise rules for sterilization have been included, which are deserving of interest, particularly in view of the extension of hypodermic medication. All solutions for hypodermic or intravenous administration have to be sterilized, whether this is specially indicated or not. The recipients and apparatus used are to be sterilized at a temperature of 160° for half an hour, or one hour in an air-bath, or by means of steam in an autoclave at 115° for half an hour. This method is to be adopted in the case of substances which do not decompose at this temperature, *e. g.*, stovain, gelatin, caffeine, physiological salt solution, etc.

In the case of solutions of substances which undergo decomposition at this temperature (adrenalin, apomorphine, atropine, quinine, cocaine, codeine, ergotine, eserine, morphine, narceine, novocain, pilocarpine, sparteine, strychnine, etc.), a boiling water-bath is to be used, keeping the water at the same level as that of the solution, or sterilization for half an hour in an autoclave at ordinary pressure. Solutions of substances which decompose at 100° (glycerophosphate of calcium, heroin, strophanthin, etc.) are to be sterilized by "tyndalization," *i. e.*, by main-

taining the solution for one hour in the water-bath, or incubator, at a temperature of 50° to 60°, and repeating this operation five or six times at intervals of twenty-four to forty-eight hours. Filtration through a Chamberland filter is to be resorted to in the case of substances liable to decompose at lower temperatures, such as serums, ferments, organotherapeutic preparations, duboisine, scopolamine, hyoscyamine, etc.

As a precaution, in order to be sure that perfect sterilization has been effected the use of Gosio's test solution is prescribed; this is carried out by the addition to the solution, prior to filling in ampuls, of a sterilized solution of potassium tellurite 1 : 100,000, and keeping the sealed ampuls in a thermostat at 30°–35°, whereupon the non-sterilized ampuls will exhibit a black precipitate. Precise indications are also given for sterilizing oily solutions intended for subcutaneous exhibition. The solvent has to be previously sterilized, and oils are to be deprived of their acid content by treatment for three days with alcohol (95 percent), in the proportion of 30 grams of alcohol to 100 grams of oil. At the end of three days the alcohol is decanted and the same operation repeated twice, whereupon the oil is sterilized for half an hour at a temperature of 160°. Liquid paraffin should have a neutral reaction, and be sterilized in an autoclave for twenty to thirty minutes at 115°.

TESTING GLASS FOR ALKALI.

The following test is included for ampuls and flasks. Ten or twelve ampuls or five or six flasks are filled with a 1 to 2 percent solution of morphine hydrochloride, or 5 percent solution of strychnine nitrate, or 1 percent solution of mercuric chloride, closed and maintained in an autoclave at 112° for thirty minutes. If the glass is neutral, no change will have taken place; if, however, it is alkaline, the solution of morphine becomes brown and shows a precipitate of free alkaloid; the solution of strychnine yields a crystalline precipitate, and that of mercuric chloride a reddish brown precipitate.

THE MONOGRAPHS.

The text of the articles included in the Pharmacopoeia, as well as the official titles, is in Italian, the Latin designation appearing as a synonym. The descriptions and tests are given in concise language, the impurities being indicated in brackets. Appended to each article is a list of the preparations into the composition of which the substance in question enters. In the case of chemicals the empiric formula as well as the molecular weight is stated. In the case of essential oils the statement "dextrogyrate," or "laevogyrate," alone appears and no degrees of optical rotation or refractive indices are given; this is influenced by the fact that "these properties vary for different qualities of the same genuine oil, and, further, their determination demands the acquisition of costly apparatus, which cannot be demanded of the pharmacist." No definite tests for arsenic or lead limits have been included.

Turning to a consideration of the single articles, the following points may be mentioned:

Boric Acid.—A limit of 0.5 percent of sulphuric acid is admitted, to be determined by the following test: 1 gram of boric acid is dissolved in 30 grams of water, and, after acidulation with hydrochloric acid, 0.1 cc of normal solution of barium chloride is added, the solution brought to boiling, and filtered. On the addition of a further amount of barium chloride solution no cloudiness should appear.

Tartaric Acid.—Melting-point about 170°. Ash not more than 0.5 percent.

Aconitine.—Formula: $C_{34}H_{47}NO_{11}$. Should not have a bitter taste (amorphous alkaloids of aconite).

Balsam of Peru.—Specific gravity 1.135 to 1.150. On shaking in a test-tube for one minute, 5 drops of balsam of Peru with 3 cc of solution of ammonia, only a slight foam should be formed, which disappears within a short time, and the mixture should not become gelatinous even after twelve to twenty-four hours (colophony and other coniferous resins). Saponification value 224.6.

Balsam of Tolu.—Acid value 112 to 168; saponification value 154 to 191.

Copaiba.—Specific gravity 0.96 to 0.99. Distilled in a current of steam, it is required to yield 40 to 60 percent of essential oil and 60 to 40 percent of resin. Acid value 75.8 to 84.2; saponification value 84.2 to 92.7.

Sodium Benzoate.—The salt, with one molecule of water, should contain not more than 11.2 percent of water.

Benzoin.—Not more than 8 percent should be insoluble in alcohol (90 percent); ash limit 2 percent.

Sodium Bicarbonate.—The limit of neutral carbonate is fixed at 2 percent and 1 gram, after drying over sulphuric acid, is required to yield not more than 0.638 gram of residue on incineration.

Acid Quinine Hydrochloride.—The following test for the presence of barium chloride has been included: An aqueous solution of 0.1 gram should remain clear on the addition of 1 drop of dilute sulphuric acid. It is required to contain 81.6 percent of quinine.

Quinine Bisulphate is required to contain 59.15 percent of quinine. On drying at 100° it should not lose more than 23 percent in weight.

Borax.—Sulphuric acid limit 0.5 percent (same test as for boric acid).

Sodium Bromide.—Should not contain any water of crystallization. Sodium chloride limit 2 percent.

Oil of Theobroma.—Iodine value 34 to 38. The solution in ether should not yield an acid reaction.

Caffeine.—Melting-point 236° to 237°.

Camphor.—Melting-point 179°. Soluble 1 : 2,000 of water. Powdered camphor shaken with water should yield a liquid which is not rendered cloudy by the addition of solution of silver nitrate (ammonium chloride).

Cantharidin.—Melting-point 218°. Soluble 1 : 3,300 alcohol, 1 : 80 chloroform.

Codeine.—Melting-point about 153°.

Dry Extract of Belladonna.—Alkaloidal content 0.5 percent.

Liquid Extract of Male Fern is required to contain 20 to 28 percent of crude filicin, tested by the method indicated in the B. P.

Extract of Hyoscyamus.—Alkaloidal content 0.5 percent.

Silver Fluoride.—The description of this substance is followed by the note that "its use may be substituted in every instance by that of silver fluorosilicate, which is obtainable in 10 percent solution."

Gelatin.—Should contain not more than 17 percent of water. When immersed in water it should absorb at least 12 to 13 percent of the latter; the more it absorbs, the better the quality.

Menthol.—Melting-point 44°; boiling-point 212°. A small crystal of menthol dissolved in a mixture of 1 cc of acetic acid, 3 drops of sulphuric acid, and 1 drop of nitric acid should not impart a yellow color, turning to emerald-green, to the liquid (thymol).

Amyl Nitrite.—On mixing 1 cc. of amyl nitrite with 1.5 cc of alcohol and 1.5 cc of solution of silver nitrate, and adding a few drops of solution of ammonia, the mixture should not blacken (valerianic aldehyde).

Castor Oil.—Saponification value 180 to 182, iodine value 80 to 85.

Pancreatin.—1 part of pancreatin in alkaline or neutral solution is required to digest 100 parts of moist fibrin within five hours, at a temperature of 45°. 0.1 gram of pancreatin should liquefy within a short time, at 45°, 500 grams of mucilage of starch, prepared with 30 grams of starch, and the resulting liquid, after filtration, should render colorless four times its volume of Fehling's reagent.

Liquid Paraffin.—Specific gravity 0.875 to 0.890; it should not contain hydrocarbons boiling below 300°.

Hard Paraffin.—Melting-point 68° to 72°.

Senega Root.—Shaken with water it should produce a foam (senegin content about 3 percent). Five grams of powdered root is macerated with 30 grams of ether and filtered; 20 cc of tepid water is added to the filtrate; on evaporating the ether the aqueous solution should assume a violet coloration on the addition of solution of ferric chloride. Ash limit 3 percent.

Theobromine and Sodium Salicylate is required to contain about 45 percent of theobromine. A solution of 2 grams in 10 grams of water, to which solution of sodium hydroxide is added, is shaken up with chloroform, the latter removed and evaporated. The residue should not exceed 0.01 gram (limit of caffeine).

Quinine Sulphate.—One gram should dissolve completely at a temperature of 40° to 50° in 7 cc of a mixture of two volumes of chloroform and one volume of absolute alcohol, and, on cooling, the liquor should remain clear (magnesium sulphate, sodium sulphate, salicin sugar, boric acid, starch, etc.). Five grams of quinine sulphate dried at 100° is shaken up with 200 cc of boiling water, and allowed to cool under agitation; the crystals which separate are removed by filtration under reduced pressure. The liquid is concentrated to about 10 cc and cooled, whereupon the crystals which separate are again removed by filtration under reduced pressure. The remaining liquid is evaporated to dryness in a weighed crucible, and the residue incinerated. The weight of the mineral residue thus obtained should not exceed 0.08 gram (0.16 percent) (soluble salts which might influence the application of the ammonia test).

Kerner's test (ammonia test) has been adopted with a few slight modifications. 0.3 gram of quinine sulphate is allowed to effloresce at 40° to 50° and shaken with 30 cc of water, maintaining the mixture in a water-bath warmed to 70° to 80°. After half an hour the contents are removed from the water-bath and allowed to cool during two hours to the temperature of its surroundings, whereupon it is placed in a large container with water of 15°, and left therein for another two hours, shaking frequently. It is first of all filtered through a clean, dry piece of cloth of 10 square centimeters, and the filtrate is again filtered through good filter-paper of a diameter of 7 cm., in such a way that three separate portions, each of 5 cc, are

each filtered into a graduated cylinder provided with a glass stopper. To the third portion, which must have a temperature of 15°, 7 cc of solution of ammonia (sp. gr. 0.96) is carefully added so as to prevent a rapid mixture of the two liquids; the solution of ammonia must also have a temperature of 15°. On gently mixing the liquids in the water-bath at 15° a clear solution should result (absence of cinchonidine, cinchonine, quinidine).

Zinc Sulphate.—Two grams of powdered zinc sulphate is shaken for ten minutes with 10 cc of absolute alcohol, and filtered. The filtrate, diluted with 10 cc of water, should not redden blue litmus paper (sulphuric acid).

Strophanthus Seeds.—Both the Hispidus and Kombé varieties are included under this title, only one description being given for both.

Tartarated Antimony.—The tests are as follows: 0.5 gram dissolved in 10 cc of water should not yield a precipitate on the addition of a mixture consisting of water 8 grams, neutral lead acetate 2 grams, and acetic acid (57 percent) 4 grams (absence of acid potassium tartrate). It is also tested for the presence of antimony and potassium oxalate: 1 gram dissolved in 20 cc of water and acidulated by the addition of tartaric acid should yield no precipitate on the addition of solution of calcium chloride.

Thymol.—Melting-point 49° to 50°; boiling-point 228° to 230°.

Tincture of Aconite.—Alkaloidal content, 0.05 percent.

Tincture of Digitalis is required to yield on evaporation at least 2.5 percent residue.

Tincture of Strophanthus.—Prepared from the seeds without previous removal of fat.

Valerian Rhizome.—To be collected from plants two to three years old, in the spring.

SOME NEW FORMULAS.

The following formulas for some galenical preparations may be mentioned:

PODOPHYLLIN AND CASCARA SAGRADA PILLS.

Podophyllin	0.20 gram
Dry extract of cascara sagrada	4 grams

Make into 20 pills.

COMPOUND SYRUP OF HYPOPHOSPHITES.

Calcium hypophosphite	34 grams
Sodium hypophosphite	20 "
Ferrous sulphate	7.5 "
Quinine bisulphate	1 gram
Citric acid	1 "

Dissolve the ferrous sulphate, quinine bisulphate, and citric acid in 100 grams of water at 40° to 60°; at the same temperature dissolve the hypophosphites in 200 grams of water. The warm solutions are mixed and allowed to cool; the precipitate is separated and washed with 100 grams of water, and in the collected liquids dissolve 600 grams of sugar, adding sufficient water to produce 1,000 grams of product.

To prepare compound syrup of hypophosphites with strychnine, add 0.1 gram of strychnine nitrate to 1,000 grams of the above syrup.

SYRUP OF CALCIUM AND SODIUM GLYCEROPHOSPHATES.

Calcium glycerophosphate	15 grams
Sodium glycerophosphate cryst.	15 "
Citric acid	10 "
Water	60 "
Syrup, or orange syrup	900 "

COMPOUND SYRUP OF POTASSIUM GUAIACOLSULPHONATE.

Potassium guaiacol sulphonate	3 grams
Orange-flower water	10 "
Syrup of calcium lactophosphate	89 "

NAPHTHOLATED CHARCOAL.

Wood charcoal	40 grams
Beta-naphthol	30 "
Magnesium oxide	30 "
Alcohol (95 percent)	50 "

Mix the powders, add the alcohol, and reduce to a coarse powder by means of gentle heat.

HYDROUS LANOLIN.

Lanolin	30 grams
Water	10 "
Liquid paraffin	6 "

PHENOLPHTHALEIN PILLS.

Phenolphthalein	1 gram
Milk sugar	2 grams
Syrup and gum acacia	q. s. to make 10 pills

THE PHARMACOPOEIA AS A GUIDE.

In Continental countries the official Pharmacopoeia is regarded essentially as the authoritative compendium for the guidance of the pharmacist in the exercise of his daily duties, and in many countries, in addition to embodying the legal standards to be complied with as regards drugs and preparations, reagents and apparatus, the various laws and regulations affecting the exercise of the profession are also included. This course has been followed as heretofore, in compiling the new edition of the Italian Pharmacopoeia, and in the appendices we find a wealth of information of interest, in addition to the customary tables.

In the appendices are included: A list of reagents and volumetric solutions; notes on the determination of the acid, saponification and iodine values; alcohol tables; a table giving the comparisons between specific gravities and the degrees found by Baumé's aerometer, and also by Cartier's and Gay-Lussac's alcoholometers; a table of drops to one gram, and the weight of each normal drop, for a number of liquids; maximum single and daily doses for certain heroic drugs. Further we find lists enumerating the utensils and apparatus with which every pharmacy must be provided, the substances to be kept in a locked cupboard, those to be kept protected from light; a list of certain drugs and chemicals which may be sold outside a pharmacy, but only in quantities exceeding the minimum amount stated against each; thus the sale of 1,000 grams of boric acid, or of 100 grams of krameria root, is permitted to any dealer, but for smaller amounts the pharmacist is the sole legal vendor. This list is followed by one indicating those official substances which may be supplied by a pharmacist without a prescription, and by lists of the official remedies which must be stocked by every pharmacy, and also a list of utensils and of remedies to be included in the medical cupboards, *i. e.*, stocks of medicines kept by certain institutions, etc. These tables are followed by eighty-three pages devoted to pharmaceutical legislation. In the first place the whole of the Italian pharmacy law of 1913 is reproduced, and the regulations issued in connection with this measure. Then follow excerpts from the various health laws of 1907, 1910, 1916, several regulations dealing with the sale of alcohol, saccharin, etc., in so far as these affect the pharmacist in the exercise of his profession. The terms of the Brussels Convention of 1902 are also included.

The new edition, however, discloses an important omission—it does not contain the list, with formulas, of those pharmaceutical specialties which have been approved by the Board of Health. The Ministerial circular of 1898, calling upon manufacturers of specialties to submit, for inclusion in the Pharmacopoeia, the following details—formula, length of time that the specialty has been on the market, places where it is principally sold, total annual output, and the methods adopted by the manufacturer to determine its active principles—have been duly inserted, but the familiar list of Italian as well as a few foreign specialties, with their composition, which in the previous edition filled thirty-two pages, is absent.

The work closes with an index of all the titles and synonyms appearing in the volume with the addition of trade-mark names, and an index of the contents.

HOW TO CASH IN ON A PHARMACY COURSE.*

BY J. A. POOL.

This query to a group of college professors and research men may seem trivial and inappropriate. To the prospective pharmacy student it is vital. To the young man who has only a few years to devote to special education and only a limited amount of money this problem is one of the most important he will ever be called on to solve. Many do not give it careful consideration because they have a vague idea that the business of conducting a pharmacy is always pleasant and profitable. Pharmacy schools are full of students who have never had a day of actual store work, who have no business ability and never will. Hence the financial wrecks and disappointments in the business. It is equally true that many young men after a few years of practical store work lose all interest in the business and drop it without ever taking the college training. Therefore it is most important to the student, to the college and to the public that every person who contemplates the acquiring of a practical store experience should carefully search for the correct answer to this pertinent question, "Can you cash in on a college course?"

Incidentally and personally it may be said that the writer of this article was graduated from the Philadelphia College of Pharmacy at the age of 19½ years and since 1887 has been the owner and operator of a drug store and is at the present time. The observations herewith submitted are not the result of theory or of hearsay, but of experience and observation in towns and cities of all sizes from Chicago down to the one-drug-store town.

PURPOSE OF HIS EDUCATION.

It is safe to assume several things in this connection—one is that every student who enters a school of pharmacy does so with the intention of using his education ultimately as a means of making his living, whether it be as a pharmacist, a special chemist, a college professor or research man.

Another certainty is that no one, or few, at least, ever become wealthy in the vocation no matter how well they are satisfied with their work.

Another and very encouraging feature is that so many fields are offered which have as their starting point the education which may be acquired at a pharmacy college. Of these the only one which the writer will attempt to discuss is the retail drug business, for the very apparent reason that is it the only one he knows anything about.

A casual investigation will show that there are several distinct varieties of institutions now doing business which are all classed as drug stores. At Rochester, Minn., is a store which handles the prescription work from the Mayo Brothers Hospital. They employ a large force of registered pharmacists and do not depend to any great extent on the merchandising feature. In the Columbus Memorial Building in Chicago is another store which does practically no retail business except compounding the prescriptions of the physicians whose offices are in the building.

VARIOUS KINDS OF STORES.

In one of the best towns in South Dakota is a store which is operating as nearly as possible along these lines—at the same time doing analytical work for

* Read before Section on Commercial Interests, A. Ph. A., New Orleans meeting, 1921.

the physicians. Stores like these are not very numerous but must be intensely interesting and profitable.

Another class of stores is represented by the big stores in prosperous cities in the west, conducted by careful business men who are good pharmacists—not necessarily college men—men who are good merchandisers. These stores have their prescription department segregated—generally in the rear of the store—and the prescription work is handled by registered pharmacists who are nearly all college graduates. The front of the store contains the usual line-up of cigars—soda fountain—sundries—books—stationery, etc. The proprietor has learned by this time that it is not necessary to employ registered pharmacists to sell these goods and can use less expensive help. He has also found out that about the only person in his store who knows or cares anything about the wall-paper or paint stock is himself—therefore he is gradually dropping that line. He sells anything that is fair and honest and shows a reasonable profit. His town is so far from a city that he can realize a fair profit on his goods and as a general rule is making money on them.

This kind of a store is ideal for a man who combines the qualifications of being a good pharmacist and of being naturally a good business man; possessing the merchandising instinct of knowing what goods will sell and how to sell them. A man who may possess the best and most complete scientific education in pharmacy but who does not have the business instinct would lose money in this kind of a store. The lure of the laboratory would keep his attention away from the merchandising of his store—which he does not really care for and is not interested in as he should be, and what money he makes in the back of his store will be lost in the front.

Next come the stores in the countless small towns throughout the country which are large enough to support only one or two drug stores. These stores sell a varied line of goods—often in large quantities to country trade. There is not enough business in regular drugs and medicines to make these stores pay without the help from the side lines. Often the owner gets into various enterprises outside of his drug store and many of them make more money thereby than the city stores, but they must be especially adapted to country store ways and people. A druggist who does not like life in a small town and who does not intend to become part of the social and political organization of the town and really become one of the people had better stay away from a small town for he will not succeed.

Coming back to the city drug store, once more, as found on almost any business corner, we have one of the greatest problems of all. The overhead is high, the hours are long, these stores are in direct contact and competition with cut-rate stores of all kinds, and the variety of goods sold outside of drugs and medicines do not run into much money. A Chicago druggist, this summer, told me the highest priced article in his stock was a hot water bottle. Very few of the goods carried, known as nationally advertised goods, allow a margin of profit sufficient to pay their share of the overhead expenses. Where, then, does a store of this kind produce a satisfactory profit? The only apparent answer is that the prescription department carries the load with strong help from the soda-water side of the business.

The only hope for these stores is a large volume of business which few of them realize. If you are interested in this feature some time get chummy with the bookkeeper in your jobbing house and get him to tell you how many of these stores

are covered with chattel mortgages in favor of the jobbers. On the other hand, many city stores fortunately located and rightly conducted do an immense business and the small profits on the merchandise are more than overcome by the large volume of sales.

If you are a city man—or if you prefer living in a city rather than a small town—and if you have some financial backing to start on, you have a right to aspire to the ownership of one of these profitable city stores. If you are not a good man for a city store and if your means are limited—think it over very carefully—otherwise you may spend most of your life working for your jobbers.

YOU CAN CASH IN.

Certainly it is possible and not very difficult to cash in on a college course provided the young man will first satisfy himself as to what his qualifications and inclinations are, and then go ahead. If his ability is all scientific he will probably make more money working on a salary than in going into business himself, remembering also that a man will do better work and achieve a greater degree of success in following an occupation that he likes and enjoys than he will in working at something with which he is not contented. In my town are five former druggists who are all still active as business men. Two of them are graduates of pharmacy colleges and both of them were out of the business before they were 30 years old. Of these five former druggists, two are bankers, two are insurance men, and one is a farmer, and all are successful in their present lines. These men all dropped the vocation in which they started and bettered their condition, yet any one of them could have stayed in the business and made a success. Why did they quit? My idea is that after a few years in the store work they concluded they did not like the business. What a waste of time and money would have been avoided if they could have realized this before they started.

If the young men who contemplate entering the drug business would only give as much time and thought to its various phases as they should, if they would work as clerks a few years before determining, if they would only think ahead—the druggists of the future would be happier and more successful than many of to-day, for the drug business to those who like it and work for it, brings a reward. Its changes, its prospects and its possibilities are never-ending, and it is more business-like than any other profession and more professional than any other business.

ANTHRAX.

Dr. Douglas Symmers, Director of Laboratories, Bellevue and Allied Hospitals, and Dr. D. W. Cady, pathologic interne, Bellevue Hospital, recently contributed an article on the subject to the *Journal A. M. A.* They purchased shaving brushes from street vendors, which they submitted to bacteriologic examination. They state:

"Out of a total of forty-one brushes thus investigated virulent anthrax bacilli were isolated in three instances, or 7.3 percent. In thirty-two brushes, or 78 percent, bacilli were grown that presented morphologic and cultural features closely resembling those of the anthrax bacillus, but guinea pig inoculation was attended by uniformly negative results—so-called anthracoid bacilli. From the remaining six brushes no suspicious colonies developed.

"These results show that shaving brushes of the sort that we examined are all too often harbingers of anthrax bacilli of exalted virulence, and the wonder is, not that so high a percentage of cheap brushes is infested, but that cutaneous anthrax following their use is not more common. No doubt man's relatively high degree of immunity to anthrax and the posession of an unbroken skin by the users of contaminated brushes serve as protection in many cases."

THE DEPARTMENT OF THE AMERICAN CONFERENCE OF PHARMACEUTICAL FACULTIES

A SYMPOSIUM ON METHODS OF TEACHING COMPOUNDING IN THE CONFERENCE SCHOOLS (*continued*).

[Editor's Note: In the publicity work of the Conference it is not the intention of the Chairman of the Executive Committee to embarrass the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION or any other journal by seeming to advertise any individual or any institution. The sole object of this work is to inform us as to what is being done, how it is being done, and what agencies are being used for teaching purposes in order that we may learn how to improve teaching methods in every institution giving pharmaceutical instruction. The most effective method of doing this, is to ferret out the men who are doing things and have them tell us what they are doing, over their own signature. Too often have college men been charged with the crime of being dreamers. Some of them are having dreams come true. This department is an open forum and the editor will appreciate contributions from every one who has anything constructive to offer.

RUFUS A. LYMAN, Chairman
and Conference Editor.]

The University of Tennessee School of Pharmacy is organized as a branch of the College of Medicine. The College of Medicine controls the Memphis General Hospital and of course the Out-Patient Department of the General Hospital. Both the Hospital and the Out-Patient Department are used for teaching purposes for our students in pharmacy. We make use of them especially in the following way. All of the prescriptions written by physicians for patients in the hospitals or in the Out-Patient Department are filled either in the drug room of the hospital or the drug room of the Out-Patient Department. These are not filled out of stock numbered formulas, and the physicians may write their prescriptions for any drug or preparation recognized by either the U. S. P. or N. F. There are a few preparations carried in stock that are accepted in "New and Non-Official Remedies" of the American Medical Association but these are not many. Patents and proprietary drugs are not carried at all. In the Out-Patient Department an average of 135 prescriptions is filled each day. The drug room is in charge of a full time pharmacy teacher and he is assisted by a section of the junior pharmacy class. The regular hours for laboratory prescription filling are not dispensed with, however. This course is given and given thoroughly with the aim and purpose of preparing the student for the work in the dispensary. It is coördinated with that work as closely as possible.

The drug room of the Memphis General Hospital is also operated by a full time teacher in our school of pharmacy. He is assisted by a section of students from the senior class. The organization of the teaching here is the same as in the Out-Patient Department drug room.

We have tried to imagine an ideal arrangement for teaching the art of compounding, and our arrangements here are based upon this ideal. We think that we have approximated it very closely.

O. W. HYMAN, *Acting Dean*,
College of Medicine,
University of Tennessee, Memphis.

* * * * * *

I have been handling the question that you have presented and I am sure I feel in hearty accord with the work that the executive committee has planned along the lines of publicity. I have been busy with a similar program here in our own State but we have followed a somewhat different plan. In place of giving a general program we are giving the druggists of the State specific information relative to business organization, and legislative measures which are of vital importance to the pharmacists of our community.

Of course, you are acquainted with the fact that I am very strongly in favor of the combination of the so-called ethical and practical pharmacy. I have formulated some plans along these lines which I hope will enable us to give training in practical experience within the school and under the supervision of a thoroughly trained commercial pharmacist. Personally it is my plan to equip thoroughly a large store and secure from the various pharmaceutical houses standard grade preparations which are of therapeutic value, and scientific preparations such as serums, vaccines, etc. Likewise it is my plan to have in that store a window and give a course in window display which may consist of a certain number of displays with a grade of units for each display. Likewise, I hope to give in connection with this at least a year of business law that may be adaptable to the business interests of an ordinary drug store.

I have thus far succeeded in securing a committee from the State association which has met once and has approved of the plans as outlined, with the exception that they do not wish the store to engage in the sale of these preparations. To my mind the actual sale of the preparations to the students of the college is comparable to the condition which a student will meet after he goes into the retail store. The main objection to the plan is chiefly that a State institution should not engage in business in competition with a local store; to be specific—the school of pharmacy should not establish a business enterprise that would run in competition with our local drug stores. However, we have at this time a dispensary for the preparation and filling of prescriptions for the students and college community only.

You will see, therefore, that the plan outlined for the store would be only a technical difference from the plan which we now have in practice. The State Board of Pharmacy is in hearty accord with the idea and are willing to grant experience gained in such a store as quickly or perhaps are more in favor of the experience gained in it than in the various stores of the State.

It is my plan to begin training in the store after the student has had the full two years of technical training which now leads to Ph.G. degree. I should like also to continue the course which leads to Ph.C. degree. This would enable the student of pharmacy to choose for himself between "commercial" and "professional" pharmacy. It would supply better trained pharmacists as drug clerks and would still leave the way open for those who desire to pursue their course for a B.S. and further if they choose.

E. R. SERLES, *Professor of Pharmacy*,
South Dakota State College.

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I sincerely hope that you will see that an article gets into the journals as soon as possible stating the attitude of all university men against a definite requirement of one year or one minute practical drug store experience that is compulsory over

and above a four years' course in college. If they wish to require one year of practical drug store experience in addition to the two or three year course, well and good, but one thing that I am interested in is the fact that in Mr. Walton's recommendations, as I interpret them, hospital experience is not given as much credit as retail drug store experience. We have found in our hospitals here in the work that we have been doing in the past year, that the pharmacist receives more pharmaceutical training and more dispensing experience in one of our free dispensaries in one afternoon than the average pharmacist receives in a drug store in a month and some of them in a year. When a free dispensary keeps three or four pharmacists just as busy as they can be for four hours at a stretch, with everything compounded in advance, so that all they have to do is fill prescriptions, mix and compound prescriptions, and not manufacture new substances, those men are really getting some pharmaceutical experience.

EDWARD SPEASE, *Dean*,
Western Reserve University, Cleveland.

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Concerning the subject of drug store prescription experience *versus* that offered in a standard college of pharmacy, I believe there can be no question but that the latter offers the better training. I have had an opportunity to see the subject from both angles. I have worked in the prescription department of a first-class prescription store in a large city and have given prescription work in college, and there isn't the slightest doubt in my mind but that the college work is better in: (*a*) the range of prescription practice, (*b*) the thoroughness of supervision and instruction, and (*c*) the neatness and accuracy with which the work is required to be done.

HOMER C. WASHBURN, *Dean*,
College of Pharmacy,
University of Colorado, Boulder.

DEATH OF PROF. A. W. LINTON, SECRETARY SECTION ON HISTORICAL PHARMACY, A. PH. A.

We are in receipt of a letter from Dean C. W. Johnson, of the University of Washington School of Pharmacy, in which he notifies us of the death of Prof. A. W. Linton on January 26, 1922, of typhoid fever. The deceased was Secretary of the Section on Historical Pharmacy A. Ph. A. A biographical sketch will appear in the March number of the JOURNAL.

SUMMARY OF STUDENTS ENROLLED IN CONFERENCE

BY WILLIAM

	Ala.	Ariz.	Ark.	Calif.	Col.	Conn.	Del.	D.C.	Fla.	Ga.	Idaho	Ill.	Ind.	Ia.	Kan.	Ky.	La.	Me.	Md.	Mass.	Mich.	Minn.	Miss.
1 Ala. Polytech.	55									3													
2 U. of Calif.	1	1		100							3						1				1		
3 U. of So. Calif.		7		94	1						2	1			2						1		
4 Geo. Washington U.								7											1				
5 Univ. of Ill.	1	1	1									192	3	4			1						1
6 Univ. of Notre Dame						1						4	6	1	1					1	2	1	
7 Purdue Univ.												7	63	1									
8 Highland Park		1	2		1						1	6		44								5	
9 Univ. of Iowa											1	1		65									
10 Univ. of Kan.															76								
11 Louisville C. P.													3			76							
12 Tulane Univ.	2		1														27						7
13 Univ. of Maryland	1					1	1	1											56				1
14 Massachusetts C. P.						13						1	1					18		247			
15 Univ. of Mich.						1		1				10	3	1							71		
16 Univ. of Minn.												1										99	
17 Univ. of Miss.	1																1						52
18 St. Louis C. P.	1	1	12									31		1	3								1
19 Univ. of Nebraska					1							1		2									
20 Creighton Univ.					3									10	1							3	
21 Univ. of Mont.																							
22 Brooklyn C. P.					1								1										
23 Buffalo C. P.																							
24 N. Y. C. P. (Columbia Univ.)						21												4	1			1	
25 Fordham Univ.	1					2														1			
26 Union Univ. (Albany C. P.)																							
27 Univ. of N. C.																	1						
28 Western Reserve Univ.																							
29 Ohio State Univ.									1	1						1							
30 Univ. of Okla.	1		3																				
31 North Pacific Coll.				1							1												
32 Oregon Agri. Coll.				5							10		1										
33 Univ. of Pittsburgh								2	1													3	
34 Phila. C. P. and Science	1		1			1	1	1		1	2		1		1				4				
35 S. C. Medical Coll.																							
36 So. Dak. State Coll.												1										7	
37 Univ. of Tenn.			12									1					1						3
38 Baylor University																							
39 Medical Coll. of Va.																							
40 State Coll. of Washington				1							8												
41 Univ. of Washington											10												
42 Univ. of West Virginia																							
43 Univ. of Wisconsin												7	2									2	
44 Meharry Coll. of P.	4		7						3	6		2		1		2	7				1		3
TOTAL	69	11	39	201	7	40	2	11	6	11	38	266	84	130	84	79	39	22	62	249	76	121	68

*Presented before Joint Session Section on Education and Legislation A. Ph. A., American New Orleans meeting, 1921. For action on this report see p. 988, December JOURNAL A. PH. A.

SCHOOLS OF PHARMACY IN 1920–1.*

B. DAY.

Mo.	Mont.	Neb.	Nev.	N. H.	N. J.	N. M.	N. Y.	N. C.	N. Dak.	Ohio.	Okla.	Ore.	Pa.	R. I.	S. C.	S. Dak.	Tenn.	Tex.	Utah	Vt.	Va.	Wash.	W. Va.	Wis.	Wyo.	Insular Possessions & Foreign	Total	
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82	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	134	18
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1	..	..	..	..	61	..	453	..	..	1	..	..	3	..	..	..	..	1	..	1	..	..	..	..	..	6	554	24
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..	..	..	..	..	2	..	138	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	142	26
..	..	..	..	..	..	..	..	65	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	68	27
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..	..	..	..	..	..	..	1	..	..	141	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	147	29
..	..	..	..	..	..	..	..	..	..	..	154	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	159	30
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..	2	..	..	..	..	1	..	..	..	..	..	163	..	..	..	..	..	..	..	..	..	14	..	..	..	3	199	32
..	..	..	..	..	..	..	..	..	..	16	..	..	256	..	..	..	..	..	..	..	1	..	6	1	..	..	286	33
4	..	..	..	1	42	..	6	2	2	11	..	..	460	..	..	..	1	2	..	1	3	..	2	..	2	7	560	34
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3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	27	1	..	..	..	..	..	..	..	..	48	37
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..	..	..	..	..	..	..	..	15	..	..	..	..	..	..	3	..	3	..	..	..	89	..	6	..	..	1	117	39
..	2	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	66	..	..	..	..	79	40
..	3	..	..	..	..	..	..	..	..	..	..	5	..	..	..	..	..	..	..	..	..	139	..	..	..	1	158	41
..	..	..	..	..	..	..	..	..	..	1	..	..	2	..	..	..	..	..	..	..	..	..	30	..	..	..	33	42
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	82	..	1	96	43
2	..	..	..	..	..	..	..	3	..	..	8	..	1	..	10	..	8	15	..	..	..	..	2	..	..	..	85	44
103	40	124	2	26	112	2	1278	88	4	312	173	193	738	3	86	59	47	90	5	12	104	229	58	92	5	59	5759	

Conference of Pharmaceutical Faculties and National Association of Boards of Pharmacy,

BIBLIOGRAPHY OF PHARMACEUTICAL RESEARCH

Conducted by H. V. Arny, Reporter on the Progress of Pharmacy, Chairman of the Committee on Research.

On these pages, each month, will be found a list of articles on pharmaceutical research that appear in the pharmaceutical and other scientific journals of the world. Whenever possible, the list appearing a certain month will record articles appearing in American journals of the preceding month and articles appearing in foreign journals will be recorded as quickly as possible after the journals reach the Reporter.

All articles appearing in these lists will be presented in abstract form in the bound volumes of the YEAR BOOK which will be issued as soon after the end of the year represented as editing and printing conditions permit. Those desiring abstracts immediately can obtain same for a fee of one dollar each by communicating with H. V. Arny, 115 West 68th St., New York, and arrangements can also be made for securing photographic reproductions of entire articles at moderate prices when such are desired.

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Chem. & Drug., 95 (Dec. 17, 1921), 803

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and its branches shall become the property of the Association, with the understanding that they are not to be published in any other publication than those of the Association, except by consent of the Committee on Publication."—By-Laws, Chapter X, Art. III.

Reports of the meetings of the Local Branches should be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly, and manuscript should be signed by the reporter. To maintain its activity and representation each branch should see that at least three of its meetings during the year are reported in the JOURNAL.

BALTIMORE.

The January meeting of the Baltimore Branch of the American Pharmaceutical Association was held at the Emerson Hotel on Wednesday, January 25, 1922, 8.30 P.M., President John C. Krantz, Jr., in the chair.

The main feature of the evening was the lecture of Charles Stevens, the subject being "Vitamines."

Mr. Stevens in his clear, concise manner, enumerated the interesting experiments that have been made in connection with vitamines, using lantern slides to show the almost marvelous effects of their administration to undernourished children, as well as the unfavorable conditions of rats, pigeons, dogs and other animals when one or more of the vitamines have been withheld from their diet and the favorable condition of these animals when the vitamines have been given along with the other food. The members of the Baltimore Branch are always glad to have the benefit of the instructive lectures given by Mr. Stevens.

Then followed the election of officers for the current year; the following were elected:

President, Dr. Hermann Engelhardt, 2912 Garrison Ave., Baltimore, Md. *Vice-President*, John C. Krantz, Jr. *Secretary-Treasurer*, B. Olive Cole. *Committee Chairmen: Membership*, Wilmer H. Shulze, *Science and Practice of Pharmacy*, Dr. Daniel Base, *Professional Relations*, Chas. L. Meyer, *Education and Legislation*, E. F. Kelly.

Charles C. Neal, 303 W. Pratt St., is the representative of the Branch in the Council of the A. Ph. A.

B. OLIVE COLE, *Secretary.*

CHICAGO.

The 123d meeting of the Chicago Branch of the American Pharmaceutical Association was held at the Hotel LaSalle, Friday evening, January 6. The meeting was preceded by a dinner in honor of Dr. A. S. Burdick, President of the Abbott Laboratories, who later addressed the meeting.

President C. M. Snow presided, and as this was the annual meeting of the Branch, he called on the Committee Chairmen and the Secretary-Treasurer for reports. The Secretary-Treasurer's report is as follows:

The Chicago Branch of the American Pharmaceutical Association was organized in February 1906, therefore we are very near our sixteenth birthday. We have made a gain in membership during the year and are running neck and neck with the New York Branch for the largest membership among the Local Branches of the American Pharmaceutical Association.

The membership of the Branch January 1, 1921, was 348; we have received during

the year 1921, 63 new members of whom 26 are from the classes of the School of Pharmacy, 19 from a special campaign in Chicago, 6 from the Soldier and Sailor members, 3 moved into Chicago territory, and 9 through the personal efforts of William Gray, General Secretary Day and others. We have lost from the membership roll a total of 49, four by death: H. E. Zimmerman (1921), W. A. Scheddel (1918), J. A. Jehlik (1906), S. W. Williams (1887), 28 by suspension and resignation and 17 by moving out of the Branch territory. The number who have moved from Chicago has been unusually large during 1921, though this is probably accounted for by the large number of new members received from the classes at the School during 1920. We have, therefore, a net increase of 14 in membership giving us a total, December 31, 1921, of 362 members. In addition to this 45 applications for membership are pending. These will give a splendid start for the year 1922.

The Branch has held eight regular meetings —the 115th to 122nd, inclusive. The average attendance at the meetings was 38.

FINANCIAL STATEMENT.

Receipts.

1921		
Jan. 1—Bal. on hand		$122.09
	Branch dues	117.00
	Commission for new members	103.00
		342.09

Expenses.

1921		
	Printing and postage	141.37
	Expenses for dinners	28.85
	Speakers	76.01
	Rooms	20.00
	Miscellaneous	8.14
	Balance	67.72
		342.09

The Nominating Committee presented the following report which was unanimously adopted and the nominees elected:

OFFICERS.

President, Clyde M. Snow.
1st Vice-President, H. N. Bruun.
2nd Vice-President, Otto H. Mentz.
3rd Vice-President, Mrs. Amanda Stahl Druehl.
Secretary-Treasurer, E. N. Gathercoal.
Council Member, Clyde M. Snow.

COMMITTEE CHAIRMEN.

Membership, William Gray.
Legislation, James H. Wells.
Practice, I. A. Becker.
Medical Relations, Dr. Bernard Fantus.
Publicity, Samuel C. Henry.

Chairman Snow then announced that we would have the pleasure of listening to a member of the Branch who was one of the charter members and one of the most constant attendants at our meetings.

General Secretary of the A. Ph. A., William B. Day, then took the platform and very greatly surprised the Secretary by the presentation, as a token of esteem from the members of the Branch and in commemoration of eight years of secretarial duties, of a very handsome brief case, suitably lettered in gold. The Secretary very highly appreciated the gift and in a very limited way tried to express his appreciation.

Dr. A. S. Burdick presented in a most interesting manner his paper on "The Manufacture of Synthetic Chemicals in America." The paper had such an extensive array of important statements that it can hardly be reviewed in this brief report. The discussion was very extensive and instructing and participated in by many of the members present including Dr. Bernard Fantus, Wm. Gray, Fred. W. Meissner, I. A. Becker, Daniel Doherty, L. E. Warren, O. U. Sisson, H. J. Holthoefer, Dr. W. G. Searle, Dr. Carl Nielson, Dr. E. H. Bolwiler, Prof. C. M. Snow, Prof. A. H. Clark and others.

Dr. Burdick presented samples of many of the newer chemicals, some that they had very recently prepared in their research department and promised great therapeutic value. He mentioned especially the fine results that have been obtained from benzyl fumariate and benzyl aceto-salicylate. During the discussion I. A. Becker made a special plea for the inclusion of chemically pure dextrose in the next revision of the United States Pharmacopoeia. This led to the presentation of a resolution unanimously endorsed, addressed to the Chairman of the U. S. P. Revision Committee, requesting that this article be included in the next revision.

The attendance at this meeting was exceptionally good, and an announcement was made of the next meeting, which will be held at the College of Pharmacy Building. The Laboratory—Pharmaceutical, Chemical and Biological—in the Retail Drug Store.

E. N. GATHERCOAL, *Secretary*.

DETROIT.

The third regular meeting of the 1921–22 season was called to order by President Washburne, December 9th. Minutes of the November meeting were read and approved without correction.

Dr. Earl Miller, of the Department of Experimental Medicine of Parke, Davis and Co., then gave the address of the evening. His subject was "The Standardization of Drugs."

Dr. Miller first called attention to the profound responsibility that rests upon physicians and pharmacists in the prescribing and dispensing of medicines. Then it was emphasized that a faithful discharge of these responsibilities must depend directly upon the availability of remedies of standard potency. That crude drugs met in commerce are often of strength different from the standards was indicated by the presentation of results of many analyses. Thus was demonstrated the necessity for identification of crude drugs used by pharmacists and manufacturers and for the assay of the finished preparations of all sorts. General comment was made concerning the various general methods of assay.

The entire lecture was entertainingly illustrated by a set of well-chosen stereopticon slides. There followed a rather lengthy and diversified discussion of the lecturer's subject, a special interest seeming to lie in digitalis. On the part of the Association discussion was led by Messrs. Jones, Hall, Washburne, Seltzer, Webster and Crandall.

On invitation of the chair the chairman of the program committee announced briefly some plans for the programs early in 1922. It is expected that programs soon to follow will be specially concerned with Historical, Practical, and Scientific Pharmacy and will be prepared by committeemen markedly able in these lines.

A resolution expressive of thanks and appreciation for Dr. Miller's address was introduced by Mr. Hall and adopted by the Association.

E. R. CRANDALL, *Acting Secretary.*

JANUARY MEETING.

The January meeting of the Detroit Branch of the American Pharmaceutical Association was called to order by President Washburne, said meeting being held after a well-served dinner in the parlor of the Wayne County Medical Society Building.

Edward K. Field was named Secretary *pro tem* by the chair. The minutes of the December meeting were read and approved.

A letter of resignation from Secretary Moore was read, and the action to be taken thereon was placed before the Branch. After inquiry as to the possibility of Mr. Moore being able to continue his duties as secretary it was found that due to personal illness this would be impossible. It was moved and seconded that his resignation be accepted, and regret was expressed.—Carried.

It was moved and seconded that Mr. Field be nominated for Secretary. Mr. Chostner moved that nominations be closed which was seconded, and carried. Mr. Seltzer moved that the chair cast the ballot, which was seconded and carried.

The paper of the evening was read by Dr. Herbert M. Rich entitled "Diseases Due to Protein Sensitization." Dr. Rich had done considerable original research work on this particular subject which enabled him to give a very interesting résumé of cases on this subject. After the paper's conclusion Dr. Rich was the target for a hail of questions which brought added interesting features, during which there was a general discussion.

Prof. Henry Kraemer's letter accepting the Association's invitation to speak at the February meeting was read by the secretary. The title of his paper is "Doing Things." On motion it was suggested that ladies be invited to attend our monthly dinner and hear the address by Professor Kraemer.—Carried.

A unanimous vote of thanks was extended to Dr. Rich in appreciation of his affording the Branch one of its most interesting meetings of the year.

EDWARD K. FIELD, *Secretary.*

NEBRASKA.

The regular monthly meeting of the Nebraska Branch of the American Pharmaceutical Association was held at Pharmacy Hall, University of Nebraska, on the evening of December 15. The meeting was well attended and a very interesting program was offered. The Branch was fortunate in having two members of the State Board, Niels Mikkelsen, President of the Board, and Charles Hildebrand, as speakers on the program.

The report of Mr. Hildebrand on the 18th annual convention of the National Association of Boards of Pharmacy held at New Orleans last August and the discussion of this report by Mr. Mikkelsen were especially interesting. Other numbers on the program were: a discussion of the Anti-Cancer Crusade by Dr.

Albert Schneider, of the College of Pharmacy, and a discussion of the proposed legislation increasing the tax on alcohol, by J. B. Burt, also of the College of Pharmacy.

At the close of the program, two sets of resolutions were drawn up and unanimously adopted by the Branch. The first expressed the approval and commendation of the Branch to the National Association of Boards of Pharmacy in adopting the report of their Committee on Practical Experience, which reduced the required experience for eligibility for examination to two years, at least one of which must be spent in a retail pharmacy, and clearly defining what would be considered as experience in pharmacy. The second resolution expressed the disapproval by the Branch of the proposed increase in the tax on alcohol used in medicinal preparations and in manufacturing, and gave reasons for the objections to this act.

J. B. BURT, *Secretary-Treasurer.*

RESOLUTIONS.

It is hereby resolved: That the National Association of Boards of Pharmacy is to be commended upon their action at their 18th annual convention held at New Orleans last August in adopting the recommendations of their Committee on Practical Experience, and that the Nebraska Branch of the American Pharmaceutical Association unanimously approves the recommendations adopted at this meeting—more particularly the recommendation decreasing the actual experience requirement for eligibility for examination to two years, at least one of which must be spent in a retail pharmacy, and the recommendation concisely defining what shall be considered as actual experience, and that the Branch is of the opinion that this action in standardizing practical experience is one of the most important steps in the advancement of pharmacy taken in recent years.

WHEREAS it has been proposed by the Finance Committee of the United States Senate to increase the tax on distilled spirits used in manufacturing and in the preparation of medicines from $2.20 to $6.40 per proof gallon, and

WHEREAS it is further proposed to provide for the refund of an amount of the tax equal to the increase, when it has been shown to the "satisfaction" of the Commissioner of Internal Revenue that such alcohol has been legitimately used in manufacturing or preparation of medicines, and

WHEREAS the increasing of the tax will work a hardship upon the sick and infirm of the nation in cases where the druggist is unable to procure acceptable affidavits covering the disposition of alcohol, causing the price to be abnormally high, and almost prohibitive in price for certain classes of people, and

WHEREAS it is self-evident that the application of such a tax, if all refunds are paid as proposed, cannot increase the revenue of the Government in the least, but would only entail additional work and expense in keeping unnecessary records, and

WHEREAS the increase in tax will have a deterrent effect upon the general advancement of science along the lines of chemical and pharmaceutical research; therefore be it

Resolved, by the Nebraska Branch of the American Pharmaceutical Association, that we voice our most emphatic protest against the increase of tax on distilled spirits, and be it further

Resolved, that we ask the Senators and Representatives of the State of Nebraska in Congress, to exert their influence to prevent the passage of this proposed legislation upon its introduction in the Senate or in the House of Representatives.

NEW YORK.

The January 1922 meeting of the New York Branch of the American Pharmaceutical Association was called to order in the Lecture Hall of the New York College of Pharmacy Bldg., Monday, January 9, 1922, with President Wm. C. Anderson in the Chair. Twenty-eight members were present.

The minutes of the preceding meeting were read and approved.

Officers' Reports.—The treasurer's report was read by the secretary and filed. The secretary brought in a short report on the conditions of the Branch.

Membership Committee.—The following applications were received for membership in the Parent Organization.

Wm. Jos. Kitzer, 102 Lowell Ave., Jamaica, N. Y.; Thos. W. Prach, Jr., 759 S. 15th St., Newark, N. J.; Daniel Hoffner, 20 East 100th St., New York City; Theodore E. Caruso, 635 Greenwich St., New York, N. Y.; Wm. Taylor, 2355 Valentine Ave., New York City; Emil Fennell, 438 East 142nd St., New York

City; Philip Muller, 91 East End Ave., New York, N. Y.

Audit Committee.—Dr. Jacob Diner reported that he had gone over the books of the treasurer and found them as stated in the treasurer's report. This report was ordered filed.

Education & Legislation.—Mr. C. L. Eddy brought in a report which was ordered filed.

Council.—Dr. Hostmann reported on the business before the Council including the question of the time for the next Convention and the proposal to move the Journal office from Philadelphia to Washington; he also read the 1922 budget of the Association. After discussion by Messrs. C. L. Eddy and Jacob Diner the report was ordered received.

UNFINISHED BUSINESS.

The Report of the Nominating Committee was received and read as follows:

President, Curt P. Wimmer.
Vice-President, Chas. W. Holzhauer.
Secretary, Hugo H. Schaefer.
Treasurer, Gustave Horstman.
Committee Chairmen:
Progress of Pharmacy, George C. Diekman.
Fraternal Relations, Henry B. Smith.
Education & Legislation, Clyde L. Eddy.
Membership, Robert L. Gerstner.
Audit, Jacob Diner.

It was moved, seconded and carried that one ballot be cast regularly electing the candidates as presented by the Nominating Committee.

President Anderson then installed the new president, who with a few words of thanks then took the chair.

It was moved, seconded and carried that a vote of thanks be extended to the outgoing president.

SCIENTIFIC SECTION.

Dr. Diekman now brought in a report consisting of abstracts of various articles including the following subjects:

Tiloform, Proparin, Hypotonin, Caluos Red, Caluos Yellow, Novacetyl, Oxygenated Glycerin, Pectine, Philogen, Mixt. Magnesia Magenpulver, Loco, Coumarin.

Test for adulteration of tragacanth.

Detection and estimation of veronal.

Conservation of hydrastine.

Use of iodic acid as a microscopic reagent for identification of various substances.

A discussion of U. S. P. and N. F. deletions was now opened and the following took part: Messrs. Diner, Lampa, Lascoff, Mayer, Currens, Berg, Schaefer, Bonisteel.

It was moved, seconded and carried that the proposed preparations which were to be deleted be considered and voted upon one at a time. The result was that the following of the Proposed List of Deletions* from U. S. P. be retained:

Acidum Hydrocyanicum Dilutum
Acidum Hypophosphorosum Dilutum
Acidum Nitrohydrochloricum Dilutum
Ammonii Iodidum
Ammonii Salicylas
Ammonii Valeras
Anisum
Arnica
Bismuthi Betanaphtholas
Bismuthi Subsalicylas
Caffeina Citrata
Calcii Glycerophosphas
Calcii Hypophosphis
Camphora Monobromata
Cerii Oxalas
Chondrus
Copaiba
Diacetylmorphinae Hydrochloridum
Fluidextractum Sarsaparillae Compositum
Foeniculum
Liquor Sodii Arsenatis
Lithii Bromidum
Lithii Citras
Matricaria
Potassi Hypophosphis
Quininae Salicylas
Sarsaparilla
Sassafras
Sodii Arsenas
Sodii Arsenas Exsiccatus
Sodii Glycerophosphas
Sodii Hypophosphis
Sodii Phenolsulphonas
Sparteinae sulphas
Strontii Bromidum
Strontii Iodidum
Syrupus Hypophosphitum
Syrupus Sarsaparillae Compositus
Taraxacum
Triticum
Zinci Carbonas Praecipitatus
Zinci Phenolsulphonas
Zinci Valeras

The votes were favorable for the retention of preparations following listed with the proposed deletions from National Formulary:

Liquor Hydrargyri et Potassii Iodidi
Pilulae ad Prandium

* For list see December JOURNAL A. PH A., p. 935.

Tinctura Pimpinellae
Vinum Colchici Seminis
Vinum Ferri Amarum

Dr. Jacob Diner then asked information regarding the strength of camphorated oil, one of the preparations to be considered by the committee of which he is chairman, and a short discussion followed.

HUGO H. SCHAEFER, *Secretary.*

PITTSBURGH.

At the meeting of the Pittsburgh Branch held at the College of Pharmacy on the evening of November 15, P. Henry Utech of Meadville, Pa., a member of National Formulary Revision Committee, was present and read a paper on the subject "Revision of the National Formulary," with special reference to deletions and additions. Mr. Utech presented a list of the new articles which has been submitted to the Committee from numerous sources for inclusion in the revised edition of the N. F. as well as a list of articles which have been recommended for deletion. The articles in both lists were read and thoroughly discussed, with the object in mind of discovering whether the articles suggested to be dropped were indicated in prescription writing to a sufficient extent to justify their being retained or deleted; at the same time whether the character of the articles requested to be added was of such a nature as to fill any appreciable want; Mr. Utech disclaimed the oft-repeated statement that the N. F. was merely a volume of formulas intended to replace popular proprietary preparations and said such an opinion is entirely erroneous. It was suggested by the secretary that, on the other hand, many of the popularly advertised proprietary preparations are articles the formulas for which had been purloined from the N. F. and exploited under private titles to both physicians and the public. Mr. Utech was pleased with the interest shown by those present and expressed himself as being well repaid for having come to Pittsburgh by the useful information he had been able to glean.

B. E. PRITCHARD, *Secretary.*

COUNCIL BUSINESS

A. PH. A. COUNCIL LETTER NO. 7.
(Abstract.)

WASHINGTON, D. C., January 17, 1922.

37. Recommendation of House of Delegates relative to change in Program Committee—carried. This was motion No. 24, instructing Program Committee to confer with the Chairman and Secretary of the House in arranging the program for the next annual convention.

38. Date of next annual convention—Result of vote fixes date for the week August 14 to 19, 1922. The Statler Hotel has been selected as headquarters.

Secretary Day expresses his approval of the foregoing decisions as follows:

"I am pleased with the dates selected by the local committee for the 1922 meeting. I hope that there will be no delay in securing the Statler Hotel for that week. The National Association of Retail Druggists has already secured the Statler Hotel at Detroit for their convention which will be held September 25th to 29th."

39. Budget of appropriations for 1922 (see Item 34). In this connection, Secretary Day writes:

"I have checked over the proposed budget and have no changes to suggest. The members of the Council have no doubt noticed that we have had a heavy loss of members during the year owing to suspensions, resignations and deaths. It will be necessary to watch our expenditures very carefully during the coming year or we will face a deficit, especially if we undertake, as I hope we will, to get out two issues of the Year Book."

Motion made by S. L. Hilton, seconded by A. G. DuMez, to approve Applicants Nos. 81 to 99, elected.

41. Proposed plan of procedure for Committee on A. Ph. A. Permanent Home. Dr. James H. Beal writes from Camp Walton, Florida, under date of January 10, as follows:

> "I move the approval by the Council of the enclosed plan of procedure for the Committee on A. Ph. A. Permanent Home.
>
> "The plan has already been approved by a majority of the Committee. Kindly advise me of the result of the vote at as early a date as possible and oblige."

PLAN OF PROCEDURE FOR COMMITTEE ON A. PH. A. PERMANENT HOME.

(1) That the Committee on Permanent Home be authorized to appoint such sub-

committees and teams for the solicitation of subscriptions as it may deem necessary.

(2) That all subscriptions be made payable to the treasurer of the A. Ph. A. and kept as a separate fund, and deposited on interest in a bank, approved by the Finance Committee, or invested in U. S. Government or other public securities capable of quick realization in the form of cash.

(3) That all interest accumulations be added to the principal of the original subscribed fund.

(4) That the money obtained by subscription be devoted exclusively to the purchase or erection and equipment of said home, or to an Endowment Fund for the maintenance of the same; and that no part of such original fund shall ever be used for current expenses or for any other purposes than those above indicated.

(5) That the matter of the selection of the city for the location of the Home be postponed until a fund sufficient in the opinion of the Council to erect and equip such home shall have been accumulated.

In order to hasten action on this matter a vote is being called for at this time, but will be considered tentative in case any objections are raised.

42. Treasurer's bond (see Items Nos. 22 and 27). Under date of January 6, 1922, Secretary Day writes from Chicago, as follows:

"Prof. E. F. Kelly has now furnished a bond executed by the Fidelity and Deposit Company of Baltimore, Md., for the amount of fifteen thousand dollars, as provided in article 5, chapter 5, of the By-Laws of the Association. This bonding company or trust company is the same company that has heretofore furnished the bond for Treasurer Whelpley and therefore I judge it is acceptable to the Association.

"The above-mentioned by-law provides that the bond shall be 'acceptable to the Council.' If you think it necessary, therefore, to bring the matter before the Council, I shall be glad to have you do so.

"Prof. Kelly has informed me that the National Exchange Bank of Baltimore has been selected as the bank of deposit and that this action has been taken with the approval of the Finance Committee. I have given a statement under the seal of the Association that he has been duly elected and installed as treasurer and that he has furnished a satisfactory bond."

Inasmuch as the Council has already approved the source of this bond (see Item No. 7), it is the opinion of your secretary that further action on this matter by the Council is uncalled for.

43. Proposal to distribute copies of the 1919 Year Book to members who joined after July 1, 1921. It is moved by Secretary Day, seconded by DuMez, that the 1919 Year Book be sent to the 185 members who were elected after July 1, 1921, although their dues were applied on the calendar year 1922. A vote on this proposition is called for.

Secretary Day, in presenting this motion, offers the following explanation:

"I have word from Eschenbach that they have finished mailing the Year Book and have still 570 copies on hand. That so large a number remain on hand is due to the fact that after ordering the Year Book we lost a great many members of the Association through resignation and suspension. There are 185 members of the Association whose names appear in the Year Book but to whom copies of the Year Book have *not* been sent because they joined the Association after July 1, 1921, and, therefore, their dues were applied on the calendar year 1922.

"Considering that we are so late in distributing the Year Book and because we have so large a number on hand, I think it would be an excellent plan to send to each of these members a copy of the book, but if we abide strictly by our rules, we should send books only to those who have paid dues for the calendar year 1921, since the book was published in that year. Do you not think we could make an exception of these 185 members, since quite a number of them are hospital pharmacists and especially since it may be late in the year before the next Year Book is ready?"

44. Election of active members: No. 100, George Milton Cochran, 718 So. Ashland Blvd., Chicago, Ill.; No. 101, Oscar Carl Hodel, 1107 State Ave., Freeport, Ill.; No. 102, Elmer Martin Hodel, 1107 S. State Ave., Freeport, Ill.; No. 103, John Julius Krazunas, 2452 S. Oakley St., Chicago, Ill.; No. 104, David Maurice Appel, 1131 So. Whipple St., Chicago, Ill.; No. 105, Cecil Dewey Wolfe, 5115 S. Michigan St., Chicago, Ill.; No. 106, Wing Toy, 308 S. Leavitt St., Chicago, Ill.; No. 107, Clarence Philip Gleich, 1505 W. Jackson Blvd., Chicago, Ill.; No. 108, Narcyz Joseph

Zurawski, 3702 S. Paulina St., Chicago, Ill.; No. 109, James Reader, 200 E. 51st St., Chicago, Ill.; No. 110, Isham Lawrence Lacy, 522 E. 36th St., Chicago, Ill.; No. 111, Mathew Henry Frankowski, 601 White Oak Ave., Whiting, Ind.; No. 112, Rufus E. G. Zaleski, 3201 Wallace St., Chicago, Ill.; No. 113, George E. Parks, 1825 Ogden Ave., Chicago, Ill.; No. 114, Francis C. Moss, 212 Glenwood Ave., Joliet, Ill.; No. 115, G. Boyd Law, 6243 Woodlawn Ave., Chicago, Ill.; No. 116, Alphonso William Borucki, 3715 Commercial Ave., Chicago, Ill.; No. 117, Rees D. Jones, 6306 Stoney Island Ave., Chicago, Ill.; No. 118, Isidor Bochner, 1358 W. Roosevelt Rd., Chicago, Ill.; No. 119, Ariston J. Hermano, U. S. P. H. S. Hospital 65, Virginia and Dayton Aves., St. Paul, Minn.; No. 120, N. H. Petesch, McHenry, Ill.; No. 121, Joseph D. Solomon, 3700 Armitage Ave., Chicago, Ill.; No. 122, Walter Gay Clark, P. O. Box 149, Morristown, Tenn.; No. 123, Edward P. Manville, Cor. Main & Saunders Sts., Whitehall, N. Y.; No. 124, Harry Sterling, 199 Merrick Road, Rockville Centre, N. Y.; No. 125, Israel Kaess, 2312 7th Ave., New York, N. Y.; No. 126, John F. Klipp, 109 Franklin St., Garden City, N. Y.; No. 127, John Woell, 312 Front St., Hempstead, N. Y.; No. 128, Carl A. H. Kloving, Main & Second Sts., Mineola, N. Y.; No. 129, Dorothy Parisi, 903 East 35th St., Brooklyn, N. Y.; No. 130, Sidney Fox, 686 Westchester Ave., New York, N. Y.; No. 131, Harvey Weinschenk, Main St., Babylon, N. Y.; No. 132, Harold W. Rothmon, 9115 Buckeye Rd., Cleveland, Ohio.; No. 133, Abraham Mair Africk, 360 W. Oak St., Chicago, Ill.; No. 134, Isidore Bernard Crystal, 7839 Marquette Ave., Chicago, Ill.; No. 135, J. Drummond Montieth, 43 Parker Hill Ave., Boston, Mass.; No. 136, Carl Werner Knutson, 8028 Coles Ave., Chicago, Ill.; No. 137, George Orlean Crystal, 7839 Marquette Ave., Chicago, Ill.; No. 138, John F. Prihoda, 1415 So. 59th Ave., Cicero, Ill.; No. 139, Alfred F. B. Mentzel, 1220 Vliet St., Milwaukee, Wis.; No. 140, Anthony R. Musolff, 621 6th Ave., Milwaukee, Wis.; No. 141, Robert Clarence Meadows, 3548 So. Robey St., Chicago, Ill.; No. 142, James Charles Kodera, 2428 So. Harding Ave., Chicago, Ill.; No. 143, Joseph T. Matousek, 1961 E. 81st St., Cleveland, Ohio.; No. 144, Victor Earl Koontz, Mound City, Ill.; No. 145, Matthew Cohn, 3508 W. 13th Place, Chicago, Ill.; No. 146, Frank M. Hayson, 743 N. LaSalle St., Chicago, Ill.; No. 147, Russell Reed Battershell, 555 Garfield Ave., Valparaiso, Ind.; No. 148, Harry M. Adams, 1426 Main St., Wheeling, W. Va.; No. 149, Barney S. Johnson, 2210 Campbell Park, Chicago, Ill.

A. G. DuMez, *Secretary.*

Committee Reports

REPORT OF COMMITTEE, CLOSER AFFILIATION OF PHARMACISTS AND PHYSICIANS.*

Numerous attempts, made in previous years, to bring about closer affiliation between the two professions on purely so-called ethical grounds have invariably been unsuccessful. Many get-together meetings were held in different parts of the country and while the social part was usually gratifying the discussions following the refreshments, as a rule, consisted of incriminations and recriminations, each profession telling the other their shortcomings without any real desire to mend their ways and become mutually helpful.

When, however, drastic laws, rules and regulations interfering with the honest practice of medicine and pharmacy began to be promulgated, both by Federal and State authorities, it soon became evident that the only salvation for the professions lay in intelligent coöperation. The outcome of this was the formation of the "Professional Guilds."

To those unfamiliar with this new phase of association work, a brief explanation of the objects and workings of the guilds may not be unwelcome.

The Guilds are chiefly concerned with legislative matters, embracing National and State legislation as well as rulings and ordinances by various Federal Departments and State Boards of Health. Membership in the Guild is open to physicians, pharmacists and dentists. There is a

* The report was accepted and the recommendation "that the American Pharmaceutical Association encourage the formation of Professional Guilds in all communities where none exist at present," adopted. See October 1921 Journal A. Ph. A., page 780.

State organization with subsidiaries composed of the various county organizations, each with its set of officers, generally distributed between the three allied professions, and a general secretary, usually a man well versed in legislative matters. It is his duty to keep tab on all proposed legislation affecting the professions, directly or indirectly. Whenever the interests of the people, through restrictions on the professions, are threatened a meeting is called and steps are taken to either sensibly modify or, if necessary, defeat such contemplated restrictions.

As an illustration of some of the work done by the New York Guild may be mentioned the timely and successful opposition to a ruling made by the New York State Commissioner on Narcotic Drugs. This officer issued an order (December 27, 1920) compelling physicians to write all prescriptions calling for any narcotic drug, in whatever quantity, on the so-called triplicate addict's prescription blank. Thus a patient requiring one-sixth of one grain of codeine, in solution or otherwise, for amelioration of cough or some similar condition, would practically be registered as an "addict" with the Board of Health. As a further result of this and other foolish attempts at restricting the rights of the public and professions the Guild undertook, successfully, to abolish the office of said Commissioner so that at the present writing New York State is working under a law, the same as the Harrison law, and the members of the professions know definitely what is required of them in the matter of purchase, prescribing and dispensing narcotic drugs.

The Guild also took an active part in the numerous "Welfare" bills safeguarding the interests of the public and professions. It appears that the best way to promote closer affiliation between the professions is to support the existing Guilds and to aid in the formation of new ones in those States and communities where none exist at present. It must be borne in mind that the Guilds are just as altruistic in their work and endeavors as the highest type of professional associations possibly can be, and no fear need be entertained that we are forsaking ethics and are entering into purely commercial and legislative pursuits. The first and most important consideration of the Guild is the safeguarding of the interests of the public and the professions.

With that end in view we recommend that this Association encourage the formation of Professional Guilds in all communities where none exist at present.

Respectfully submitted,

(Signed) JACOB DINER, *Chairman.*

REPORT OF COÖPERATIVE PUBLICITY COMMITTEE, AMERICAN PHARMACEUTICAL ASSOCIATION.*

To the President and Members of the American Pharmaceutical Association:

The Coöperative Publicity Committee was appointed as a part of the plan to secure proper publicity for all branches of Pharmacy by the creation of a National Board consisting of representatives of eight of the National Pharmaceutical Associations.

The Chairman of your Committee was delegated to represent the Association on this National Board, which held its first regular meeting shortly after the 68th Annual Meeting of the American Pharmaceutical Association. On June 30, 1920, representatives of the eight National Pharmaceutical Associations met at the Hotel Marlborough-Blenheim, Atlantic City and organized the Drug Trade Board of Public Information. The Chairman and Secretary of the Board were designated as the Executive Officers who were to prepare and distribute news bulletins regarding Pharmacy to the Public Press and to assist State and local Pharmaceutical Associations in the preparation of their publicity material. It was decided to tax each one of the National Associations represented on a basis of their income so as to provide sufficient funds to start the work. Six months elapsed before the funds were collected and the Board now has about $1000 on which to start its work.

Shortly after its organization, it was found that the plan of procedure outlined was not feasible in certain particulars and steps have since been taken to remedy this condition.

The Second Annual Meeting was held at Chicago, July 22, 1921, and after a lapse of a year of practical inactivity, as far as the issuing of news bulletins is concerned, the Board has at last commenced to function. It should be stated that a great deal of time was consumed in studying the methods of other associations along the lines of publicity and considerable information has been amassed which has been of great value in shaping the plans of the Board.

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* The report was received and referred to the Publication Committee. See October JOURNAL A. PH. A., page 781.

At the Second Annual Meeting, the following method of procedure was outlined:

1. The authority for issuing bulletins to the newspapers and magazines has been vested in the Director of the News Service. This action was necessary because newspapers are interested only in the news items of the moment. Under the previous plan worked out by the Board, every bulletin had to be submitted to the representatives of each of the eight National Associations represented in the Board and the delay in securing approvals was fatal to the news items. Our attempts to initiate news bulletins and to correspond with the eight members of the Board clearly demonstrated that it was impossible to work a plan of this kind and that the only way of successfully conducting the work of the Board would be to select one individual in whom all the Associations had confidence enough to initiate bulletins and get them out at a time when the newspapers are ready and willing to publish them. The Director of the News Service is also the Chairman of the Drug Trade Board of Public Information.

2. The bulletins to be issued by the Board must be absolutely free of any propaganda involving the sale of drugs, medicinal preparations or other articles usually sold in drug stores because such propaganda would immediately kill the value of any bulletin and its acceptance by newspapers.

The News Bureaus conducted by State Associations and groups of Associations have invariably developed into sources of propaganda material designed to help retail drug store sales. For this reason, few bulletins issued by these services are published by the newspapers unless at the special request of a retail druggist who is also an advertiser in the paper. It is perfectly proper for State Associations to undertake publicity campaigns of this nature and to take advantage of the influence that individual druggists have with the newspapers in their home towns, but as far as National Publicity for Pharmacy is concerned, this method is absolutely out of the question.

3. Every effort is to be made to furnish State Association Publicity Committees, News Bureaus and other Organized News Dispensing Agencies inaugurated by Pharmacists with bulletin material gathered by the Drug Trade Board of Public Information, but the bulletins which go out under the name of the Board will be free of any propaganda material, although bulletins issued from other sources may use the material supplied by the Board as they see fit as long as the name of the Board is not associated with such revised bulletins.

4. The first official bulletin issued by the Board referred to the Conventions of the American Pharmaceutical Association, the National Association of Retail Druggists and the National Wholesale Druggists' Association.

Other bulletins are being prepared and are being released to the press from time to time. Several sample bulletins are attached to this report.

It is the hope of the Director of the News Service of the Drug Trade Board of Public Information, that College Professors, Officers of State Associations and National Associations, Chairmen of Publicity Committees and others will coöperate actively with the Board in sending in suggestions for news and educational bulletins.

The Office of the Drug Trade Board of Public Information is Room 361, Metropolitan Tower, No. 1 Madison Avenue, New York City.

Respectfully submitted,
(Signed) W. H. COUSINS,
E. L. NEWCOMB,
EDWARD DORSEY,
ROBERT P. FISCHELIS, *Chairman*,
THE COMMITTEE ON PUBLICITY.

The following communication was filed with preceding report.*

New York, August 24, 1921.

Prof. W. B. DAY,
General Secretary, American Pharmaceutical Association,
701 So. Wood St., Chicago, Ill.

My dear Professor Day:

The Coöperative Publicity Committee of your Association will undoubtedly make a report in which the activities of the Drug Trade Board of Public Information will be

* Other communications and bulletins of the Committee on Publicity will be printed in succeeding issues of the JOURNAL.—EDITOR.

mentioned. However, inasmuch as this Board is a representative body and responsible to the various Associations which constitute its membership, we have deemed it advisable to present a report of our activities to your Convention and would be very grateful if you would read it at the proper time so that your members will get a clear idea of our aims, objects and accomplishments.

As you will note from the report, we have been able to collect the necessary funds to enable us to start our work, but if we are to continue with any degree of success, it will be necessary to receive further appropriations from the Associations holding membership in the Board.

It will not be necessary for your Convention to vote an appropriation to the Board at this time, but it would be very helpful if your Council or Executive Committee be instructed to make further appropriations to the work of the Board, if, in their judgment, such appropriations are warranted as a result of the activities of the Board, when its present funds have been exhausted.

Thanking you for your coöperation in this matter, I am

Yours very truly,

ROBERT P. FISCHELIS.

ANNUAL REPORT OP THE WORLD WAR VETERANS' COMMITTEE OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

This committee was organized at the 1920 meeting of the Association "to prepare each year a survey of pharmaceutical conditions in the United States with statistics and with special reference to the availability of pharmaceutical resources for military purposes," the idea being, with the lessons of the late war fresh in our minds, to have ready for instant use in case of national emergency, information showing how the resources of pharmacy might best be utilized by the Army and Navy.

As a first step toward compiling a list of all the manufacturers of drug products in the United States, the Chairman communicated with the office of the Surgeon General of the Army early in the year and assured himself that the information on this subject which had been gathered together during the war still was up-to-date and correct and that little could be added to it at this time. It was then decided to concentrate the efforts of the committee, for this year at least, upon securing better recognition for pharmacists in the service and, with this idea in mind, the chairman made two trips to Washington where, with E. Fullerton Cook, R. P. Fischelis, E. F. Kelly and others, conferences were held with representatives of the Surgeon General and efforts made to secure proper men for the reserve corps of pharmacists authorized by the Army Reorganization Bill.

Now, we are informed by the incoming President that the committee is to be discontinued. It does not surprise us. Four years have passed since 1917 and some of us have forgotten the feverish, wasteful efforts we made at that time to prepare ourselves for war. It is to be expected that we should not remember and that we should sink back into our complacent ways. That is according to formula and it would be unnatural if, in case of another war, we should find ourselves at all prepared for it. The pharmacists who served as hospital orderlies, stablemen, infantrymen, photographers, machine gun operators and truck drivers perhaps remember conditions a little more vividly than do those who stayed at home but they realize that it is useless to struggle against ingrained habits of thought which make it difficult for us to remember an unpleasant story and, so, make no protest against the discontinuance of the committee.

CLYDE L. EDDY, *Chairman.*

REPORT OF COMMITTEE ON INTERNATIONAL PHARMACEUTICAL NOMENCLATURE.

To the Members of the A. Ph. A. New Orleans Convention:

Your Committee on International Pharmaceutical Nomenclature begs to report progress. No steps could be taken during the war, but now after the signing of peace internationally, it is to be hoped that this important work will rapidly go on. A beginning has been made by sending the following letter to Dr. J. J. Hofman, Secretary Fédération Internationale Pharmaceutique at the Hague:

MY DEAR SIR:

Several years ago our A. Ph. A. created a *Committee on International Pharmaceutical Nomenclature.* Owing to the World's War no international steps could be taken. Now with "Peace again on Earth," our Committee is anxious to commence its work.

The object is to bring about more uniformity in International Pharmaceutical Nomenclature. Just as the Brussels Protocol has created uniformity in the strength of Potent Remedies in the various Pharmacopoeias, so we hope that in time Uniformity in Pharmaceutical Nomenclature will be brought about internationally.

As an illustration permit me to point out that at the present time great confusion exists as to the term "Digitalin," which is applied to quite a number of different digitalin preparations, glucosides or mixtures of glucosides, with an entirely different dose. It is obvious that the subject of International Pharmaceutical Nomenclature is important, very important, not only from the standpoint of uniformity, but also for the protection of patient, pharmacist and physician.

As Secretary of the Fédération Internationale Pharmaceutique we bring this matter before you and ask for your kind coöperation. Your answer in English, French or German will be greatly appreciated.

Up to date no answer has been received or could be expected. Let us hope that by next year's Convention the "ball which has been started rolling" will land somewhere.

I heartily regret being unable to be with you at New Orleans, but prefer a cooler climate. I wish you a very successful meeting, which as of old will be of benefit to our profession.

Respectfully submitted,
(Signed) OTTO RAUBENHEIMER, *Chairman.*

CORRESPONDENCE

AN APPRECIATION FOR SERVICE RENDERED.

The Journal of the American Pharmaceutical Association:

May I trespass upon your space to say a few words which I feel you will agree with me should find a place in your columns.

To promote the formation of a strong special group devoted to the interests of Hospital Pharmacists, members of the American Pharmaceutical Association, it was necessary to get the names and addresses of my fellow-pharmacists engaged in this work, so Secretary Wm. B. Day can extend them a cordial invitation to become members and form this group.

I appealed to Messrs. E. R. Squibb & Sons who at once sent out a circular letter to their representatives, with the result that I have had the great pleasure of sending Secretary Day, up to date, over 600 names and addresses, and there are more to follow.

We have great hopes the hospital pharmacists will respond in large numbers after they receive the invitation from the Association, and they will help make their special group a strong and successful one.

Messrs. Squibb & Sons have rendered a generous service, for which they have my sincere thanks and hearty appreciation and, I am sure, the whole profession will join with me in these sentiments.

Yours respectfully,
(Signed) EDWARD SWALLOW,
Pharmacist Outpatient Department, Bellevue Hospital,
New York City.

EDITORIAL NOTES

Editor: E. G. EBERLE, Bourse Building, Philadelphia, Pa.

Committee on Publication: A. G. DUMEZ, *Chairman;* J. H. BEAL, IVOR GRIFFITH, R. A. LYMAN, H. B. MASON, and the Editor-in-Chief of the JOURNAL, General Secretary, Treasurer and Reporter on the Progress of Pharmacy, *ex-officio.*

Collaborators: S. L. HILTON, President, A. Ph. A.; C. A. DYE, President, A. C. P. F.; L. L. WALTON, President, N. A. B. P.; E. FULLERTON COOK, Chairman, U. S. P. Revision Committee; CHARLES H. LAWALL, Chairman, Council A. Ph. A. The Chairmen of the Sections, A. Ph. A.: HEBER W. YOUNGKEN, IVOR GRIFFITH, W. H. ZIEGLER, C. W. HOLZHAUER, CURT P. WIMMER; E. F. KELLY and JEANNOT HOSTMANN of the House of Delegates; A. G. DUMEZ, Secretary of the Council, WILLIAM B. DAY, General Secretary, and H. V. ARNY, Reporter on the Progress of Pharmacy.

HATBAND SKIN DISEASE APPEARS IN DENMARK.

An epidemic of hatband disease in Denmark is reported in the *British Medical Journal.* The disease is caused by a substitute for leather. In some men only a narrow strip of skin is affected, but more susceptible persons get inflamed blisters around the nose and mouth.

In some cases one day's wearing of the hat produces ulceration of the forehead, great swelling of the face and a red rash over the trunk and limbs.

DISCUSSION ON VITAMINES BY SOCIETY OF AMERICAN BACTERIOLOGISTS.

Some of the virtues popularly attributed to vitamines were cast aside at the annual convention of the Society of American Bacteriologists in Philadelphia. The meeting attached so much importance to the subject in general that the opening sessions were almost entirely devoted to discussions of the scientific aspects of the vitaminic theory.

Dr. D. H. Bergey, president of the eastern Pennsylvania chapter of the society, declared that the only advantage of the vitamine in combating disease bacteria in the human system was in the stimulation of the bodily tissues. "But," he said, "the bacteria thrive in the vitamines as well as they do in bodily tissues. Thus it is apt to be an unequal race."

In further discussion of the subject, Major A. Parker Hitchens, of the Army Medical School, Washington, stated: "Vitamines are like an antiseptic. Those that kill the germs also kill the bodily tissue. Again the types of vitamines that feed the tissues also feed the bacteria. So what are you going to do about it?"

The discussion that followed these two papers aimed more direct attacks at the vitamines as an economic issue than has been made in previous conventions of the society. Scientists who have devoted the past year to research work on vitamines expressed themselves as being strongly opposed to many of the extravagant claims that have been made for vitamines by certain commercial concerns.

QUANTITATIVE METHOD FOR DETERMINATION OF VITAMINE.

A quantitative method for the determination of vitamine has been devised by Roger J. Williams (*Journal of Biological Chemistry,* 1920, xlii, 259-265). The method is for the quantitative determination of the vitamine which prevents beri-beri, and this abstract is reprinted from the *Journal of the Franklin Institute.* "A synthetic medium is prepared, each liter of which contains 20 grams cane sugar, 3 grams ammonium sulphate, 2 grams monopotassium phosphate, 1.5 grams asparagine, 0.25 gram calcium chloride, and 0.25 gram magnesium sulphate. One hundred cc of this medium is diluted to a volume of 110 cc, sterilized, inoculated with a suspension of fresh compressed yeast in sterile water containing 0.3 milligram of yeast and having a volume of 1 cc. The culture is incubated for eighteen hours at a temperature of 30° C.; growth is stopped by addition of formaldehyde solution; the yeast is collected by filtration of the culture through a weighed Gooch crucible, washed with water and with alcohol, dried for two hours at a temperature of 103° C., and finally weighed. This is the control experiment, and the yield of yeast is approximately 2.5 milligrams. At the same time, 100 cc of the synthetic medium and a definite

volume of an extract representing a definite weight of the substance to be tested for vitamine are mixed, diluted to a volume of 110 cc, sterilized, sown with the yeast as already described, and then treated in exactly the same manner as the control experiment. The yield of yeast above that in the control is a measure of the vitamine content of the substance tested. The 'vitamine number' of a material may be defined as the number of milligrams of yeast produced by the addition of its extract minus that produced in a control solution, under given conditions and within certain limits, computed to 1 gram of the original material tested."

A NEW PROCESS FOR HYDROGENATION OF FATS AND OILS.

The invention of A. Granichstadten and Dr. E. Sittig, for the hydrogenation of fats and oils, consists in the use of a double silicate of magnesium and nickel. The compound, says the *Chemical News*, is credited with remarkable results; by its use as catalyzer, the oils, even at a temperature of only 35° to 40° C., acquire an unusual degree of whiteness. With most of the known methods, the dark oils utilized for alimentary fats must be first or subsequently bleached, but those hydrogenated by this new process are perfectly white, and ready for the manufacture of alimentary fats. The catalyzer is prepared by precipitation of the double silicate so as to obtain as uniform a product as possible.

SCIENTIFIC RESEARCH CONTRIBUTES TO A NATION'S SUCCESS.

The following abstract of the transactions of the Forty-fifth Congress of the French Association for the Advancement of Science is taken from the *Chemist and Druggist*. M. Rateau, chairman of the Congress, in his opening speech, claimed that the French victories of the Revolutionary epoch were largely due to the "energetic coöperation of men of science—Berthollet, Fourcroy, Chaptal, Vauquelin, Monge, and their colleagues." The German successes in the late war were of similar origin. He quoted M. Moureu's maxim, "The whole nation ought to participate in the scientific movement," and insisted on the fact that nowadays the secret of a nation's success is the active pursuit of research work combined with the practical and industrial application of its results. The following day's proceedings had for their chief feature the lecture delivered by M. Georges Claude on scientific research and the resources of science. He spoke of Madame Curie's great discovery, and finally alluded to the half-century of effort necessary to synthesize ammonia, from 1860 to Ramsay and Young's little experiment in 1884, and Haber's production of synthetic ammonia in 1909. M. Georges Claude then explained his own solution of the production of synthetic ammonia—by means of a pressure of 900 to 1,000 atmospheres, giving an output of over 40 per cent of ammonia. He then effected in their presence the synthesis of ammonia, with a compression of a thousand atmospheres, and also performed some curious experiments in lighting by neon gas, the distillation of liquid air and of synthetic ammonia.

THE VACUUM FLASK IN THE LABORATORY.

In a monograph contributed to the *Chemical News* of December 23, Messrs. Bourlet and Thomas point out some of the uses to which a thermos flask may be put in the chemical laboratory in respect to its power of maintaining substances at temperatures above the normal. This property may be utilized for conducting reactions between liquids at elevated temperatures, and is particularly useful in the oxidation of organic compounds with potassium permanganate. It is also applicable to the separation of emulsions which may be conveniently "split" by warming and standing overnight in a thermos flask. Other applications indicated by the authors are: the separation of colloidal and flocculent precipitates; the development of color reactions; and the carrying out of reactions in gelatinizing media. Finally, it is pointed out that, at a pinch, the flask will serve as a portable incubator for bacteriological work.

LENGTH OF METER UNCHANGED.

Recently it was declared that the standard meter measure kept in the International Bureau of Weights and Measures had in some mysterious way increased in length until it was nearly a hundredth part longer than the scientific measure, which was said probably to be due to the fact that there was more heat this year than normally.

French pride was touched in view of the fact that Japan has just adopted the French standard of measure. The eminent scientist, M. Guillaume, has now stopped these rumors by his report to the Academy of Sciences in which he declares that only the measures usually employed for purposes of comparison,

had lengthened for some unknown reason, but that the real standard metal bar measure had not changed enough to write home about, the utmost variation being thirteen ten-thousandths of a thousandth part of a meter.

SYNTHETIC GOLD SOON.

Dr. Paul Darwin Foote, physicist of the Bureau of Standards, is quoted by the press as saying that we are on the way toward finding a method of transforming mercury into gold.

Prof. Irving Fisher was in Berlin last month studying the German currency problem and, incidentally, to investigate the claims of an unnamed German inventor, who was purported to have produced synthetic gold. Newspaper accounts state, "a Berlin scientist informed Professor Fisher that the inventor(?) is a fraud and has a prison record."

1921 DRUG OUTPUT.

According to a preliminary statement compiled by the Department of Commerce more than $400,000,000 worth of drug products were manufactured in the United States during 1921. The figures are based upon the returns from 524 establishments primarily engaged in the manufacture of druggists' preparations, with products valued at $114,596,900; 2468 in the manufacture of patent medicines and compounds with products valued at $212,185,700; and 570 in the manufacture primarily of perfumery and cosmetics to the value of $59,630,100. At the census of 1914 the industry "Druggists' Preparations" comprised 416 establishments with $48,009,700 in value of products; patent medicines and compounds 2903 establishments and $102,463,400; perfumery and cosmetics 496 establishments and $16,899,100. In the aggregate these classified industries involved 3562 establishments in 1919 with products valued at $386,413,000 and 3815 in 1914 with $167,372,000, an increase in value of $219,041,000 or 131 per cent. In addition like products to the value of $23,357,100 were made and $9,374,800 in 1914 by establishments in other lines of manufacture.

The production of biological products—serum, vaccines, toxins, etc.—was valued at $15,876,400, an increase of 155 percent with respect to 1914; patent and proprietary medicines $162,471,900 (*a*) for sale in unbroken unit packages to the general public $132,970, (*b*) ethical pharmaceutical specialities $29,501,600, an increase of 94.7 percent; pharmaceuticals—tinctures, syrups, pills, tablets, etc.—$77,295,900, an increase of 187 percent, and perfumery, cosmetics and toilet preparations $69, 470,400, an increase of 263 percent.

The consumption of alkaloids, their salts and alkaloid materials, as reported, cost $6,398,320, comprising cinchona bark, 1,220,000 pounds, $450,300; quinine, 183,516 pounds, $2,718,238; coca leaves, 584,000 pounds, $292,800; cocaine, 516 pounds, $90,454; opium, 102,761 pounds, $956,354; morphine, 3984 pounds, $635,912; caffeine, 39,413 pounds, $312,285; strychnine, 16,414 pounds, $872,304; codeine, 2312 pounds, $296,392; and heroine, 702 pounds, $178,585. The industries used 2,980,500 gallons of grain alcohol costing $14,466,200; 796,900 gallons of denatured alcohol, $524,000, and 73,200 gallons of wood alcohol, $106,100.

AMERICAN BUSINESS SPIRIT.

Quoting an editorial of the *New York Commercial*, January 28, and also an article of the December *Scribner's:*

"European business men visiting this country frequently comment upon the activities of our trade associations. They consider it remarkable that there should be such a generous interchange of ideas between men who are rivals in business, not having themselves absorbed the idea that anything that helps business as a whole helps them all individually. Thus we find our trade associations working for better standards of business and coöperating in general development, leaving it to individual merit to overcome competition. It is considered against American business ethics to 'knock' a rival. Salesmanship is based on convincing the buyer that one has the particular goods best adapted to his needs and leaving the buyer to make his own mental comparisons.

"American business is honestly and honorably conducted. The percentage of dishonesty is no greater than is to be found among men in general. Because there have been some dishonest people in business the preceding administrations have only too often assumed the attitude that all business was dishonest and needed watching. Laws have been made restricting the free operation of business on the theory that some one might be wrong rather than providing adequate penalties for those who actually did wrong. Big business is no longer under suspicion just because it is big, and President Harding has promised that

business men shall be considered honest until they are proved to be dishonest."

"Happily, the world of business is a noble world. If we have failed to find true nobility in it, it is because our eyes have been closed or because we ourselves have not been entirely fair."

FELONS.

The following is found in *Poulson's Advertiser*,, Philadelphia, of January 21, 1822: "Friend Poulson will serve the cause of the afflicted by inserting the following recipe for the cure of Felons, or Whitlows, which for a number of years has been successfully recommended by a respectable female of this city, *viz.:*

"Take of Indian Turnip and Garlic, each two parts, Bread, Dutch Cheese, Butter, Salt, Honey, Gin and Yeast, each one part.

"After having grated the Turnip and Cheese the whole of the ingredients may be intimately mixed in a mortar and applied to the part affected in the form of a poultice; observing to let it remain on 48 hours, which seldom fails in performing a cure."

PERSONAL AND NEWS ITEMS.

The second shipment of botanic and zoölogical specimens has recently been received from the Mulford Research Expedition; these will be distributed to scientists, museums and research laboratories.

F. R. Eldred has resigned as chemical consultant to Eli Lilly & Co., to take charge of the New York offices of Eldred & Atkinson, Inc., consulting chemists and engineers. A dinner was tendered to Dr. Eldred by the Indiana Section of the American Chemical Society, January 9, at the University Club. A feature of the evening was the presentation of a watch-fob to the guest of honor. **E. B. Carter,** president of the Section, presided as toastmaster, and made the presentation.

Leonard A. Seltzer addressed the Prescott Club, University of Michigan, at its January meeting on the subject, "Practical Pharmacy."

Prof. C. C. Glover is spending his leave of absence from the University of Michigan in botanical research at Columbia University.

Wilhelm Bodemann has made the discovery, incidental to his misfortune, that nurses must pay 10 percent at the registry office for cases assigned to them. He refers to an article on "The Nurses' Trust" by Dr. C. A. Mayo in which the latter states that nurses would have to come down with their prices, or hospitals would have to get along without them. Mr. Bodemann suggests that druggists should open up a list of nurses, and that this be free at the service of the patients; that would reduce the cost of nurses somewhat and be an ad for the druggist, at the same time an accommodation to the medical profession, to the druggists' trade and nurses.

Dr. A. R. Bliss, Jr., professor of pharmacology in the School of Medicine of Emory University at Atlanta, was elected a member of a national coöperative committee of the A. O. A. C. at the recent Washington, D. C., convention of this association. The duties of this committee consist of coöperative work, along the lines of methods of analysis and standardization of drugs, with the Committee of the Revision of the U. S. Pharmacopoeia. The coöperative committee consists of Dr. L. F. Kebler, chief of the Division of Drugs at Washington, Dr. A. R. Bliss, Jr., Dr. H. C. Lythgoe, Dr. H. C. Fuller, and Dr. W. S. Hubbard.

Walter D. Adams, Forney, Texas, has succeeded W. H. Cousins of Dallas as Secretary of Texas Pharmaceutical Association, of which he is an ex-president. Mr. Adams is a frequent attendant, accompanied by Mrs. Adams, at the American Pharmaceutical Association meetings.

J. W. Graham, Austin, Texas, has concluded fifty years of service in pharmacy in his home city. The *Austin American* of December 18 gave considerable space to a review of the city's growth and development and that of our fellow-member's business career. Aside from the drug business, Mr. Graham has taken a deep interest in municipal and State affairs; he recently retired as one of the city commissioners and was for a number of years regent of the State University; he also served on the Board of Pharmacy.

O. Henry Drug Company occupies the old Fariss-Klutz store building at Greensboro, N. C., where William Sydney Porter (O. Henry) spent many of the earlier days of his life while in the employ of his uncle, Clark Porter, who owned and operated a drug business there.

"The *Journal de Pharmacie et Chimie* devotes the whole of its December number to an interesting account of the life and work of the late Professor Bourquelot, in which the singularly active life and unpretentious character of the

deceased savant are described in a manner which will be appreciated by those who knew him personally."

The Practical Druggist celebrates its twenty-fifth anniversary with a "silver" January number; therein is much of interest in the way of historical reviews and illustrated subjects. Congratulations on the completion of twenty-five years of service are extended with best wishes for a long continuance.

MONUMENT TO THE INVENTOR OF ICE CREAM SODA.

Robert M. Green died May 21, 1920, leaving an estate of $352 000. He laid claims to being the originator of "ice cream soda," and it seems that records establish the fact, which will be further recorded on the tombstone in West Laurel Hill cemetery, Philadelphia.

OBITUARY.

W. ARTHUR SKILLERN.

W. Arthur Skillern, persident of the Texas Pharmaceutical Association and member of American Pharmaceutical Association, died January 10, at his home in Dallas, Texas. He had been afflicted with Bright's disease for a year or more, but his condition was not thought to be serious until the day before his death.

Mr. Skillern was president and general manager of a chain of retail drug stores in Dallas, operated by Skillern & Sons. He was a Scottish Rite Mason, a member of the Shrine and of the Dallas Rotary Club. He was born at Lewisville, Texas, 36 years ago, and had been a resident of Dallas twenty-five years.

The respect in which the deceased was held was shown by the closing, for a short time, of more than one hundred and fifty retail drug stores and the four wholesale drug houses of Dallas. The druggists of Dallas and representatives of the State association attended the funeral in a body. He was one of the assistant secretaries at the recent N. A. R. D. Convention.

Mr. Skillern is survived by his wife and a daughter, his mother, a brother and several sisters.

SOCIETIES AND COLLEGES.

KEEPING UP THE MEMBERSHIP OF ASSOCIATIONS.

Many trade organizations throughout the country to-day are worrying over resignations ranging from 10 to 50 percent of their total enrolment, according to Arnold A. Mowbray, director of public information, National Association of Credit Men, who has just issued a "Membership Maintenance Manual" in which he tells how to conserve man power in a commercial body during a period of depression.

The National Association of Credit Men is the largest commercial organization in the United States, having a membership of approximately 33,000 bankers, manufacturers, wholesalers and jobbers and 134 affiliated branches throughout the country.

Despite the period of retrenchment, the National Association of Credit Men obtained 4,985 new members last year and hopes to report a substantiai increase at the convention to be held in Indianapolis in June.

How the various affiliated associations of credit men are able to obtain and retain thousands of members is revealed in the manual written by Mr. Mowbray, who is national director of the membership department. He is an expert on the subject discussed and has traveled from coast to coast, delivering addresses and instructing volunteer solicitors how to obtain and retain members. Mr. Mowbray believes that the volunteer committeeman is the logical solicitor, because the prospect who is being invited to join knows that the volunteer has no pecuniary motive in approaching him. A continuous membership campaign is advocated by the National Membership Committee which is not enthusiastic over whirlwind drives, as members thus obtained often are not fully informed regarding the benefits of membership and after having joined merely to oblige a friend, usually resign at the expiration of a year, during which time they have not used the facilities of the organization.

NEXT ANNUAL CONVENTION OF AMERICAN PHARMACEUTICAL ASSOCIATION.

The American Pharmaceutical Association, the American Conference of Pharmaceutical Faculties and the National Association of Boards of Pharmacy will meet in Cleveland August

14–19. The Statler Hotel has been selected as convention headquarters.

The National Association of Retail Druggists will meet September 25–29, in Cleveland, and Statler Hotel will be headquarters.

CHANGE IN MEETING DATE OF NATIONAL WHOLESALE DRUGGISTS' ASSOCIATION.

The date of the forty-eighth annual meeting of the National Wholesale Druggists' Association to be held at the Broadmoor Hotel, Colorado Springs, Colorado, has been changed from the week beginning October 9, 1922, to one week earlier, namely October 2–5, inclusive.

By advancing the date one week members will gain the advantage of summer tourist rates to Colorado Springs which will not be allowed if railroad tickets are purchased after September 30, 1922.

"ELEVEN MEN IN EVERY PLAY."

In one of the editorials of a recent edition of the official organ of the Associated Advertising Clubs of the World, the above title has been chosen because it was the slogan of a successful football team. It is applied to the association under the assumption that success is gained by "eleven men in every play," *i. e.*, the whole team—all of the organization.

"If one of the members of the football team had sulked or become peevish because he did not like the way another member handled the 'pass,' the entire team might just as well have given up at that particular point, because so far as progress was concerned, with one man sulking on the job, the team could not gain many yards or at best make very little progress.

"Every man on the team must 'carry on,' must give of the best that is in him, and must work for the common end—winning the game—to bring success."

This is the message of the editorial to the members, and it seems applicable to all associations. While conditions are improving, and there is every reason for encouragement, this is a year during which there should be team work, not only for our country but for the organization in which we are all concerned.

THE COLLINS COLLECTION OF ALGAE ACQUIRED BY NEW YORK BOTANICAL GARDEN.

The Collins collection of algae, covering both the seaweeds and their fresh-water relatives, has recently been acquired for the herbarium of the New York Botanical Garden in Bronx Park through the generosity of its Director-in-Chief, Dr. N. L. Britton. The new accession includes more than 40,000 specimens from nearly all parts of the world, New England, Bermuda, Florida, California, Alaska, the Philippine Islands, Japan, the Dutch East Indies, South Africa, Australia and the South Sea Islands being especially well represented.

Frank Shipley Collins of Malden, and later of North Eastham, Mass., was a business man who devoted his leisure to the advancement of scientific knowledge.

The Collins collection is the latest of an important series of large collections which have been purchased to facilitate the scientific researches that are carried on in the Bronx Park institution. Among these are the J. B. Ellis collection of fungi, numbering about 80,000 specimens; the Mitten collection of mosses and hepatics, including about 50,000 specimens; the Underwood fern collection, with 16,000 specimens; the Otto-Kuntze herbarium of more than 30,000 miscellaneous specimens, presented to the Garden by the late Andrew Carnegie; the Vigener herbarium of more than 20,000 specimens, also presented by Mr. Carnegie; the A. Henry collection of Chinese plants, including nearly 8,000 specimens, and the Jenman collection of West Indian and South American ferns, comprising about 4,000 specimens and given by the late D. O. Mills, the first president of the Board of Managers of the New York Botanical Garden.

The number of specimens in the entire herbarium of the Garden is now approaching the 2,000,000 mark.

PHILADELPHIA DRUG EXCHANGE.

The annual meeting of the Philadelphia Drug Exchange was held January 24, in their rooms, 253 Bourse Building. Chairman Clayton F. Shoemaker presented the annual report, giving a review of trade conditions and legislation relating to the drug business. The following were elected officers and directors for the ensuing year: *Officers: President,* Charles E. Hires; *Vice-President,* Milton Campbell; *Secretary,* Joseph W. England; *Treasurer,* A. L. Hilles, Jr. *Directors:* Herbert R. McIlvaine, Dr. Adolph W. Miller, Adam Pfromm, C. Stanley French, Clayton F. Shoemaker, Walter V. Smith, C. Mahlon Kline, Norman K. Conderman. *Honorary Member,* Harry B. French.

Annual Banquet at Bellevue-Stratford, January 26th.

The Entertainment Committee maintained past records in menu and entertainment—Herzberg's Orchestra furnished the music, supplemented by M. A. Lennartz, cello soloist. Moving pictures, courtesy of Charles E. Hires Co., showing a trip from New York to South American points in search of roots, bark and herbs, closed the evening's entertainment. Miers Busch was toastmaster, and he presented Warwack James Price, Washington journalist, as the first speaker, who discussed the topic, "Is the Washington Conference a Success?" In his talk, he recited what has been accomplished for future peace, and declared the result to be an enduring success. Benjamin H. Ludlow moralized in his talk on "Through the Glass," and the Rev. Robert Norwood, rector of the Memorial Church of St. Paul, treating the topic "The Discovery," likened the aftermath of war to the awakening of man to his responsibilities.

STATE OF WASHINGTON PHARMACISTS ASK NEWSPAPERS TO DISCONTINUE USE OF WORD "DRUG" IN CONNECTION WITH NARCOTIC RAIDS.

The Washington State Pharmaceutical Association has passed resolutions commissioning the secretary to ask newspapers to refrain from using the word "drug" when "narcotic" is meant. It is believed that newspapers will coöperate.

The Spokane County druggists were the first to adopt measures to try to stop this newspaper practice and they subsequently called it to the attention of the State body.

For years druggists have suffered unjustly from the reporter's word and the copyreader's pencil in stories dealing with narcotic raids and arrests. The word "Dope" being barred by many newspapers, reporters and editors have substituted in most cases the word "drug." Rarely have they used the proper word, "Narcotic."

This is a timely effort which other associations should aid.

1922 CONVENTION MICHIGAN STATE PHARMACEUTICAL ASSOCIATION.

At a meeting of the executive committee of the Michigan State Pharmaceutical Association held in Detroit, January 20th, it was decided to hold the 1922 convention in Ann Arbor on June 6-8.

BOSTON ASSOCIATION OF RETAIL DRUGGISTS.

The regular meeting of the Boston Association of Retail Druggists was held at the College of Pharmacy on Wednesday, January 18, 1922. The following officers were elected for the coming year: John J. Tobin, *president;* Sidney V. Rintels, *first vice-president;* C. Fred Wright, *second vice-president;* Samuel Davidson, *third vice-president;* L. W. Griffin, *treasurer;* Chas. H. Davis, *secretary. Members of Executive Committee:* Sidney V. Rintels, Arthur C. Morey, Henry B. Knight, F. J. Patrick, P. J. Cuddyer, C. A. Stover, George E. Grover, F. H. Salisbury, John R. Sawyer, C. H. Packard, C. W. Freeman, J. F. O'Connell, W. H. Glover, Sherman N. Sears and George C. Ketchum.

FRATERNITY CONVENTION. THE PHI DELTA CHI TO MEET IN KANSAS CITY.

The Phi Delta Chi Fraternity will hold its twenty-second Grand Council at Kansas City, February 17th and 18th. Convention headquarters have been arranged at the Hotel Baltimore and a large attendance is expected.

Phi Delta Chi is one of the largest pharmaceutical-chemical fraternities in the country, chapters being located at some of the leading schools from coast to coast.

Alumni scattered throughout the country are urged to communicate their addresses to the Grand Secretary, L. C. Heustis, of 5005 Park Avenue, Indianapolis, as in common with all other college organizations, the fraternity is experiencing considerable difficulty in locating its older members scattered during the war.

FRANKLIN INSTITUTE (PHILADELPHIA) TO HAVE NEW HOME.

The Franklin Institute will have a new home on the Parkway. The cornerstone of its present building was laid June 8, 1827. The property on which the building is to be erected is owned by the Institute, and funds are on hand for the building work. Present plans first contemplate building a laboratory and museum; the main building is to cost $1,000,000, making the total building cost approximately $2,500,000.

JECKER PRIZE AWARDED TO M. LÉGER.

The Jecker Prize of 10,000 fr. has been awarded by the Academy of Sciences to M. Léger, who was for many years chief pharmacist

of the Beaujon Hospital in Paris. He is an honorary member of the British Pharmaceutical Society, and Hanbury Medalist in 1911.

MASSACHUSETTS COLLEGE OF PHARMACY.

At the January meeting of the board of trustees of the Massachusetts College of Pharmacy it was voted to make the regular course, leading to the degree of graduate in pharmacy, a three-year course beginning with the next session. Many pharmacy schools are contemplating this change, unless they have already made it, as the American Conference of Pharmaceutical Faculties has decreed that all member schools must advance to the three-year course by 1925.

The death of George Robert White has been reported, at the age of 74 years. He was president of the Potter Drug & Chemical Co., and the heaviest individual taxpayer in Boston. The magnificent building of the Massachusetts College of Pharmacy was a gift of the deceased. Further reference will be made in March JOURNAL A. PH. A.

THE PHARMACIST AND THE LAW.

MALUM PROHIBITUM.

Arthur D. Greenfield of the New York City Bar contributes an article to the *American Bar Association Journal* of September 21, in which he discusses moral, legal and practical distinctions between Mala Prohibita and Mala in Se, and points out the danger to civic conscience when former are too numerous. He presents that mala prohibita are statutory offenses not involving moral turpitude.

"They are distinguished from mala in se, which are acts supposed to be inherently wrong. This distinction rests on an assumed absolute standard of ethics, but in application usually depends on whether or not the act was an offense at common law. The decisions are not all harmonious on this point, some judges attempting to apply their own conception of moral turpitude as a standard. But if the common law test be adopted we find the distinction resting upon a sound philosophical basis. It means that acts which for a sufficiently long time and with a sufficient approach to unanimity have been recognized by our race as ethically wrong, so that the common conscience has become crystallized in the common law, are put in a special class. The category of mala prohibita, on the other hand, includes acts which only very recently have been thought to be wrong, acts which even now are regarded as wrong by a bare majority, and acts which are not considered by anybody as wrong in themselves, but which for various reasons have been forbidden. An example of the last mentioned type is prohibition of the mere possession of certain things capable of being used in a manner deemed harmful or dangerous.

"Besides the distinction founded on the nature of the acts, there is also a legal distinction which is applied in prosecutions for the two classes of offenses. In the case of mala in se it is necessary, to constitute a punishable offense, for the person doing the act to have knowledge of the nature of his act and to have a criminal intent; in the case of mala prohibita, unless such words as 'knowingly' and 'willfully' are contained in the statute, neither knowledge nor criminal intent is necessary. In other words, a person morally quite innocent and with every intention of being a law-abiding citizen becomes a criminal, and liable to criminal penalties, if he does an act prohibited by these statutes. While many statutes creating new crimes do contain words requiring proof of knowledge and intent, there is a great number in which such words are omitted, sometimes by inadvertence but more often deliberately."

Mr. Greenfield gives a number of illustrations, but the inclusion of them would extend these abstracts beyond our limits of space. As an illustration, he supposes a body of volunteer soldiers who sacrifice personal freedom willingly, obey rules without grumbling, approve of the execution of a comrade for sleeping at his post. But now assume "that the orders are so numerous and of such a nature that they are constantly being violated by a large proportion of the men unconsciously or inadvertently, and assume further that most of such violations pass unnoticed and unpunished, but that every now and then some man, through mere bad luck or perhaps through being in bad favor with the officers, is punished for doing what all the rest are doing.

"What will be the effect upon this body of men? Discipline, formerly maintained by the patriotism, 'esprit de corps' and good morale of the men, can perhaps still be main-

tained under the new conditions, but only by increasing strictness in orders, increasing severity of punishments and the vigorous use of a large body of military police. The men are the same, but their feeling has changed. They have become mutinous, sore, rebellious. They no longer respect their officers, and are inclined to resent, disobey and evade even the necessary and reasonable orders to which before they had yielded cheerful obedience.

"An excessive creation of mala prohibita tends to foster in the public mind a feeling of resentment and willingness to disobey the law. This reacts upon the situation so as to make necessary an increase in the number of mala prohibita. Ingenuity has to be exerted by the lawmakers in prohibiting innocent acts or devising regulations as to the terms and conditions on which they are permitted, in order to make impossible or more difficult the commission of some other act which it is desired to prevent. Instances of prohibitions or regulations to aid in the enforcement of other prohibitions are familiar to all. If the sale of an article is to be prevented, not only its sale but its possession and transportation are forbidden. If it is desired to prevent the use of an article for a certain purpose or in a certain manner, arbitrary restrictions are placed upon its use for other purposes and in other ways, to prevent evasion of the particular prohibition desired. We thus have a vicious circle: the more prohibitions, the greater the tendency to violate them; the greater the tendency to violate them, the more prohibitions are required."

We have probably not quoted enough of the instructive article to do justice to the author; however, the experiences of pharmacists and their observation of events will enable them to make use of the conclusions arrived at by Mr. Greenfield, which are: "Mala prohibita to be successfully prevented must be punishable without proof of knowledge either of the law or of the facts, and without proof of any criminal intent. We have also seen that the application of this principle leads to certain bad results, especially a general loss of civic conscience. This presents a problem whose solution depends on the relative importance to be attached to morality of conduct and spiritual morality. If it is more important and beneficial to society to prevent the doing of the forbidden acts than to preserve a good social morale, the solution is simple. It consists in increasing the number of prohibitive statutes and the severity of the penalties for their violation, and securing a large enough police force to enforce them with the highest possible degree of effectiveness. Any law can be quite thoroughly enforced in that way. The stringent military regulations of the Germans were very adequately enforced in the French and Belgian cities occupied by their troops in the late war.

"To get effective results by this method, while entirely practicable, would require an enormous amount of money, and I suppose that is the reason it has never been attempted. Increasing the number and severity of penal statutes has, of course, been tried, but without the employment of an adequate force. For the sake of economy other methods have been adopted, such as giving the informer a portion of the fine, winking at blackmail and graft in order to make the position of enforcement officer attractive in spite of low official pay, and—a very common method—allowing general violation of the law for long periods and then occasionally pulling off drag-net raids. These methods, while not effective in wholly preventing the prohibited acts, do accomplish something in confining their commission largely to those who make a business of it and can afford the additional overhead expenses imposed on them by law enforcement. The preference for such methods, however, creates the impression on the part of the average citizen that the government—his personification of the lawmaking powers—is hypocritical, is 'bluffing,' as he would put it, and does not really desire or intend the enforcement of these laws. He therefore has little moral compunction in violating them, being merely careful to see that he is not caught doing so.

"If the preservation of a good civic spirit is more important than the prevention of the acts sought to be prohibited, then the only solution is to do away with mala prohibita. This does not mean abandoning the penal law, since that is needed to take care of the real criminals; it means giving up the attempt to regulate conduct by statute in a manner which does not agree with the moral sense of any substantial percentage of the non-criminal population in any community to which these statutes are to be applied. There may be those who, while realizing the evils attendant upon statutory prohibitions, yet believe that certain prohibitions are required to protect the public health and morals, and that it will

not do to wait for the slow process of public education. To these I can only say that the public health and morals are not protected by penal laws which are not thoroughly enforced. Let them obtain assurance that the legislature will appropriate enough money for a rigid enforcement before they attempt to get their statutes passed, lest the harm done be greater than the harm prevented. There may be some who believe that the passage of a law has an educative effect upon the public. To these I suggest that laws for that purpose should take the form of legislative declarations, not of statutory prohibitions with penalties for their violation. But to all who seek to regulate and reform human conduct I recommend an earnest and open-minded study of human nature."

THE SENATE'S MEDDLING DISTURBS BUSINESS.

United States Senator Walter E. Edge, in the course of an address at the annual banquet of the New Jersey State legislators, January 28, said:

"The main trouble with our present economic difficulties and disturbed business conditions, is the unfortunate feeling existing in Congress, especially in the Senate, of suspicion, and the determination on the part of the lawmakers to be jealous of their prerogatives.

"There is a feeling in the Senate that it is necessary to meddle in every type of activity through some form of investigation. This tendency is well illustrated in the case of the Debt Refunding bill when it was shown that the members of the Senate even failed to trust the President of the United States on the settlement of the debts. The Senate must trust some one and purge itself of this atmosphere of suspicion, but if it won't trust the President the case seems almost hopeless.

"The fundamental evil, in my judgment, is the country's unfavorable tax system. This system is holding back every legitimate activity because investors in an enterprise are forced to pay anywhere from 404 to 65 per cent on all they make.

"All will admit, no matter on what side they happen to be, that the country will not recover its stability until we have markets. What are markets? They are the creations of business activity. There is just as much money now as before the war, if not a little more, and there are just as many people, and the only way to bring about an exchange of commodities and money is to have the people working. So, to get back to the fundamental difficulty, so long as incomes from legitimate enterprises are kept pouring into the Government, and not added to capital, where they belong, just so long will we not have markets and remain exactly where we are."

"FINISHED" SODA SYRUPS TAXABLE.

A. C. Holden, Acting Deputy Revenue Commissioner, has ruled that a concentrated syrup—"that is, a preparation which is ordinarily diluted with from three to six parts of simple syrup and to which in most instances is added acid or coloring matter producing a finished product—is not taxable under section 602 (*e*) when sold by the manufacturer thereof. If the concentrated syrup is diluted with simple syrup in the necessary proportions the resultant product is taxable under section 602 (*e*), the tax attaching when the preparation is sold or used.

"An uncarbonated beverage prepared by combining a concentrated syrup with unfermented fruit juice and water is taxable as a still drink under the provisions of subdivision (*c*) of section 602. Credit may, however, be taken for any tax reimbursed the manufacturer of the unfermented fruit juice providing such tax was passed on to the purchaser by the manufacturer of the unfermented fruit juice in a specific amount or in such a manner that the purchaser knew the exact amount being paid as tax and that the same had been or would be paid over to the Government by the manufacturer of the unfermented fruit juice.

"Where a retailer dilutes concentrated syrup with simple syrup the tax imposed under subdivision (*e*) attaches to the complete resultant product.

"A concentrate, essence, or extract is not taxable when sold by the manufacturer thereof. These are products that usually require dilution in the ratio of nineteen parts of simple syrup to one part of the essence, extract or concentrate.

"If, however, a concentrate, essence or extract is combined with simple syrup, rock candy syrup or any other ingredient or ingredients in such proportions that the resultant product is suitable for use in the preparation of soft drinks, ice cream sodas, ice cream sundaes, etc., such resultant product is taxable under section 602(*e*)."

TAX-FREE MEDICINAL ALCOHOL DECISION SOON.

The Oil, Paint and Drug Reporter states: "It is reported in trade circles that the solicitor of the Internal Revenue Bureau will soon render an opinion on the legality of using specially denatured alcohol in making U. S. P. and other medicinal preparations for internal use. Authorities charged with enforcing the law are understood to be satisfied that such use of denatured alcohol, which would be tax-free, would be within the law.

"There is a question of policy involved, inasmuch as some twenty-odd million dollars revenue are annually derived by the government from tax-paid alcohol used in medicinal preparations for internal use.

"Tax-free alcohol, denatured, has been authorized for some time in medicinal preparations for external use, as well as in perfumes and cosmetics. The trade hopes this use will be extended to internal medicinal preparations, and it is claimed in support of this principle that there would be no immediate total loss of revenue. It is said that manufacturers of internal preparations are not generally ready to proceed to use denatured alcohol, and that the revenue loss might run only a million or two dollars during the first year, perhaps $5,000,000 the second year, and gradually reach the total.

"The subject was brought up at the National Drug Trade Conference meeting several weeks ago, when a resolution dealing with the matter was offered, but, after some discussion, was withdrawn."

CHANGES IN NARCOTIC ORDER FORMS.

The *Bulletin* of the N. W. D. A., January 25th, states, that "for the purpose of throwing additional safeguards about traffic in narcotics, the Prohibition Commissioner has authorized an important change in the order forms. In the future, duplicate forms will be printed in red ink, while the originals will be in black, as heretofore. This change will facilitate distinguishing originals from duplicates and is counted upon to obviate mistakes and irregularities that have caused the Bureau much concern during the past year. In a number of cases, manufacturers and wholesale druggists, apparently in the best of faith, have filled duplicate order forms without detecting the fact that they were not originals.

"The substitution of the new forms for those heretofore in use will be made gradually as stocks are exhausted. There is a considerable supply of old forms in the hands of collectors, and these will be issued to the trade as long as they last. There is no authority in law for retiring these outstanding forms; hence they will be used up.

"The Bureau has had under consideration for some weeks a departure in the preparation of order forms that is designed to protect the Government against fraud but that would cause great additional labor and inconvenience to the drug trade, especially to the jobber. The new plan, which has not been adopted and against which, no doubt, there will be many vigorous protests, contemplates the use of a separate form for each narcotic preparation. This would be no great hardship in the case of the average small retail druggist, but it would multiply many times the labor and expense incident to operating the narcotic department of the average jobbing house."

BOOK NOTICES AND REVIEWS.

A Text Book of Pharmacognosy. By Heber W. Youngken, Ph.M., Ph.D. P. Blakiston's Son & Co., Philadelphia; 538 pages, 350 illustrations. Price, $6.00.

The first impression that one gets of "Youngken's Pharmacognosy" is that it was written by a teacher who understood how to present the subject to the student mind. There are on the market and used in our colleges of pharmacy several books which are very good as dispensatories but which can hardly be called textbooks. Dispensatories are of much value to the druggist and pharmaceutical manufacturer but not to the beginner in pharmacy. Professor Youngken's "Pharmacognosy" is a real textbook and will be gladly welcomed by teachers of pharmacy.

Chapter I, dealing with the fundamentals of pharmacognosy, is valuable, in that it paves the way for what is to come in the other part of the book. This chapter includes discussions on the valuation, the collection, and preservation of drugs and a summary of the history of pharmacognosy.

Chapter II gives a morphological classification of crude vegetable drugs. In this

chapter the author gives very accurate definitions of the botanical terms used in the Pharmacopoeia, the National Formulary, and other related works. Drugs derived from the same part of the plant are discussed as a whole and their similarities and contrasting characteristics brought out. After mastering this second chapter the student will understand fully the Pharmacopoeial descriptions of crude drugs.

Part II, on the "Taxonomic Consideration of Drugs," constitutes by far the largest part of the book. It is in this part that the author shows his skill in properly presenting the subject to the student mind. The discussion of each drug is divided into the following paragraphs:

Synonyms,
Botanic origin,
Parts used,
Habitat,
Description of the plant,
Production and Commerce,
Description of the drug,
Histology,
Description of the powdered drug,
Constituents,
Substitutes and Adulterants.

The heading of each paragraph is in boldface type which enables the student to quickly find what he wants.

In cases of drugs derived from different species and cases of drugs commonly adulterated, the author has arranged very good tables showing the contrasting characteristics by which the different species can be identified. These are quite valuable in pharmacognosy.

The book contains many illustrations, including photographs of both drug plants and crude drugs, and some showing the crude drugs in the original shipping packages. There are many good drawings and quite a few photomicrographs of crude drugs.

The book should appeal not only to students, but also to pharmacognosists in all lines of work. C. J. ZUFALL.

Bernard Courtois and the Discovery of Iodine. The *Chemist and Druggist* of January 7 abstracts interesting data and information from M. L. G. Toraude's new volume on "Bernard Courtois and the Discovery of Iodine." The volume is dedicated to the President of the Academy of Dijon. The article states that "in the early days of this Academy, a local barrister, Guyton de Morveau, was Professor of Chemistry there. At the same date (1776) a retired valet, Jean Baptiste Courtois, who lived opposite, was engaged by Guyton as laboratory assistant and general factotum. His son Bernard was born in 1777, and a few years later Jean Baptiste became, through Guyton de Morveau's influence, manager of an artificial saltpetre works. Guyton soon after (in 1791) left Dijon for Paris. Bernard grew up at Dijon, and later was apprenticed to M. Frémy, pharmacist at Auxerre. He was drafted into the army as hospital pharmacist in 1799, and subsequently went to the laboratory of Louis Jacques Thénard, with whom he had made friends at the Polytechnic. It was about 1802 when Courtois left Thénard to join Séguin, and began to study opium. He isolated from opium a crystallized body which was probably morphine. On December 24, 1809, Séguin communicated to the Institute Courtois's note on this subject. M. Toraude considers that Courtois committed the same fault with reference to morphine as with regard to iodine. His (secondary) education was but limited; this caused lack of confidence, and timidity made him hesitate. It was while washing seaweed ashes and destroying the sulphuretted compounds by sulphuric acid that Bernard Courtois noted the violet fumes which revealed to him iodine. M. Toraude suggests that he may have used a larger quantity of acid on that particular day. Courtois had not at his saltpetre works the laboratory apparatus necessary to study the subject thoroughly. He asked two Dijon friends—Desormes and Clément—to follow up the matter. Clément put the discovery before the Institute on November 29, 1813, and on December 6 and 20 Gay-Lussac read two notes which M. Toraude reprints *in extenso*. It was Clément who showed samples to Chaptal and Ampère, and to Sir Humphry Davy, when the English scientist came through Paris with a special safe conduct granted by Napoleon. M. Toraude remarks that Davy had suffered from a serious malady of a nervous nature in 1807-8."

PUBLICATIONS RECEIVED.

Das Opium. By Dr. Axel Jermstad, and published by A. Hartleben, Vienna and Leipzig. Volume 368 of the Chemico-Technic Library. The preface is by Prof. Dr. H. Zörnig. This publication was reviewed for the January JOURNAL A. PH. A. by Prof. Otto Raubenheimer.

Cultivation of Medicinal Plants. By Dr. H. Zörnig, published by *Natur und Kultur*, Dr. F. J. Böller, Munich. The paper-covered volume has 110 pages, and deals with native and cultivated plants. The cultivation is suggested as a means of livelihood for crippled soldiers; descriptions are given of plants, cultivation and drying methods, selection of plants, the acreage required, average prices and the extent of demand. A chapter gives consideration to upwards of 50 drugs, and the volume is concluded with an extensive bibliographical index.

Ash Determination of Drugs. By Friedrich Adler, apothecary in Emmendingen, an inaugural dissertation presented to the University of Basel, for the degree of Doctor of Philosophy. The author acknowledges with thanks the assistance and valuable instruction of his teacher, Prof. Dr. H. Zörnig. The work reports his ash determination of eighteen drugs, whole and powdered; the methods are fully described. The thesis closes with a tabulation of ash percentages given in 14 Pharmacopoeias representing 192 drugs. Publisher, H. M. Muth, Freiburg.

Bibliography of Glucosides and Saponins (Pharmaceutical Chemistry of the past century). A reprint from numbers 39 and 40, *Apotheker-Zeitung* (Swiss), September 29 and October 6, 1921.

For the above German publications the ASSOCIATION is indebted to Prof. Dr. H. Zörnig, Honorary Member.

Proceedings of the 10th Annual Meeting of the American Drug Manufacturers' Association. The volume contains about 400 pages. Part I is concerned with minutes of the convention in New York City, April 11–14, 1921. In the reports of officers and committees there is much interesting information relating to drug markets, legislation, sales, etc. Part IV contains memorials to deceased members; all of the deceased were also affiliated and active in the A. Ph. A. The constitution and by-laws of the Association are printed in the appendix. Parts II and III are devoted to scientific matters, such as chemical tests and standards, and reports on drugs and preparations, etc., represented by papers and discussions by members of the Association, who are in a large way engaged in drug manufacturing.

Proceedings of the forty-fourth Annual Meeting of the Pennsylvania Pharmaceutical Association, held in Philadelphia, June 8–10, 1921. Besides the transactions of the convention, the volume contains the new pharmacy laws, relating to registration of drug stores, advertising of medicines for venereal diseases, and sale of narcotics.

Bulletins and Reprints, United States Public Health Service:

"Meningococcus Carriers," their recognition and treatment; "The Bacteriological Examination of Water," comparative studies of media used; "Biological Products," establishments licensed for the propagation and sale of viruses, serums, toxins and analogous products; "The Simulation of Disease," drugs, chemicals and septic materials used therefor; "Experimental Typhus Fever in Guinea Pigs," a description of a scrotal lesion in Guinea Pigs infected with Mexican typhus; "A New Disinfectant-Testing Machine;" "Bread as a Food," changes in its vitamine content and nutritive value with reference to the occurrence of pellagra; "Trinitrotoluol," practical points in its safe handling; "Control of Diseases in Establishments for the Manufacture and Loading of High Explosives," report of Divisional Committee on Industrial Diseases, etc.

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